



**EVALUATION OF THE IMPACT OF GHANA'S PLANTING FOR FOOD AND JOBS
PROGRAM ON SMALL-SCALE FARMER MARKET LINKAGE/ ACCESS IN THE
VOLTA REGION**

By

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DECLARATION

I, Gameli Prosper Agbanu, student number #####, declare that this research report submitted to the Central University of Technology, Free State, for the degree PHD: Management Sciences (Business Management), is my independent work and has not previously been submitted by me to another university/faculty. I further cede the copyright of the thesis in favour of the Central University of Technology, Free State.

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ABSTRACT

Purpose of the study:

The Ghana's Planting for Food and Jobs (PFJ) program, seeks to among other objectives address market access barriers faced by small-scale rural farmers by strengthening marketing linkages. This study evaluated the program's effectiveness in ensuring small-scale rural farmer marketing linkages and market access.

Methodology

The study adopted a sequential mixed-method research design, incorporating quantitative and qualitative components. The sample size for the quantitative part of the study was 500, while the qualitative component involved 20 participants. A close-ended survey questionnaire was used to collect the quantitative data while in-depth interviews were used for collecting qualitative data.

Key findings

Market information, logistics support, farmer organizations, community market days, processing centres, and farmer field days and trade fairs emerged as key elements promoting market access and linkage. Information services was found to be crucial for providing market-related data that facilitate market access. On the other hand, high exportation costs, lack of storage, and inability to access regional markets poor infrastructure, low farm aggregation and limited access to credit stands as significant barriers. Market access and marketing linkages were found to have significant impact on economic performance while participation in PFJ increases farm profitability.

Based on these findings, specific recommendations are provided for enhancing the effectiveness of the PFJ and similar programs. Similarly, recommendations for future research and the contribution of the study to policy, practice and theory are provided in the appropriate sections of the report.



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ABBREVIATIONS AND ACRONYMS

Acronym/Abbreviation	Full Form
FAO	Food and Agriculture Organization
ECOWAS	Economic Community of West African States
EXIM	Export-Import (Bank)
LEAP	Livelihood Empowerment Against Poverty
MVP	Multivariate Probit Model
PSM	Propensity Score Matching
ESR	Endogenous Switching Regression
PFJ	Planting for Food and Jobs
SDGs	Sustainable Development Goals
GSS	Ghana Statistical Service
MoFA	Ministry of Food and Agriculture
FASDEP	Food and Agriculture Sector Development Policy
METASIP	Medium-Term Agricultural Sector Investment Plan
GLDB	Grains & Legumes Development Board
GSFP	Ghana School Feeding Program
GPS	Ghana Prisons Service
NADMO	National Disaster Management Organization
FFP	Food Fortification Program
WFP	World Food Program
AEAs	Agriculture Extension Agents
NTC	National Technical Committee
RTC	Regional Technical Committee
DTC	District Technical Committee
FBOs	Farmer-Based Organizations
QDS	Quality-Declared Seed
WACCI	West Africa Centre for Crop Improvement
AVDRC	Asian Vegetable Development Research Centre

CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 Introduction

The Government of Ghana in 2017 instituted its flagship agricultural policy initiative - the Planting for Food and Jobs (PFJ) program (Ministry of Food and Agriculture, 2017). This program was launched to improve Ghana's food self-sufficiency and security while reducing poverty, especially in rural areas (Danso-Abbeam et al., 2018). A key target group of the PFJ program is smallholder farmers in rural communities who lack resources and access to modern technology and markets. A major objective outlined for the program to achieve its broader goals was to facilitate smallholder farmers' access to markets and establish effective marketing linkages (Ansah et al., 2020). This is intended to ensure that any increased production from PFJ interventions does not go to waste post-harvest. However, despite the promises and potential, questions remain regarding PFJ's real-world effectiveness on the ground for the rural smallholders it targets. Hence, this study aims to evaluate the market accessibility and marketing linkage aspect of the PFJ program specifically for the smallholder farmer's segment. By exploring the range of market linkages established, support services provision, underlying drivers, prevailing constraints, and resulting economic impacts, this study analyses if the PFJ program has tangibly improved marketing opportunities for produce from small farms.

This chapter provides a comprehensive overview of the study, encompassing several elements such as the contextual background, rationale for the study, formulation of the research problem, the definition of objectives and research questions to be investigated, and the significance of the study. Additional sections within the chapter encompass a brief examination of the methodology employed, the extent of the study's scope, and the organisation of the study, among others. Furthermore, a succinct summary is provided at the end of the chapter.

1.2 Problem background

Farm input subsidies have become a widely used policy instrument across Sub-Saharan Africa to spur agricultural productivity growth amid adoption constraints for yield-enhancing modern technologies like improved seed varieties, mineral fertilizers, agrochemicals, and small-scale irrigation solutions (Jayne et al., 2018). These incentives help ease the binding liquidity limitations faced by smallholder farmers that often deter investments in productivity-enhancing inputs (Langyintuo, 2020). Additionally, well-targeted subsidies can remedy structural supply-side bottlenecks in agricultural input markets stemming from factors like under-developed distribution infrastructure in rural areas (Dorward, 2009). When efficiently delivered, agricultural input subsidy programs can have multidimensional benefits. By lowering the upfront capital costs of inputs, subsidies encourage farmers to use modern inputs, adopt new practices, and make productivity-enhancing investments that would otherwise seem risky or financially prohibitive (Arndt et al., 2016). This spur in input use and technology adoption can catalyze yield growth, higher incomes, and agricultural growth during transitional periods (Liverpool-Tasie et al., 2020).

Additionally, lower production risks during economic shifts and stress periods can aid farmer welfare and food security. However, outcome gains are contingent on the effective targeting of recipients and pairing subsidies with complementary services like extension advice (Oyinbo et al., 2022). If underpinned by solid institutional frameworks, governance structures, and accountability mechanisms, input subsidy schemes can be an effective catalyst for agricultural development (Ndlovu & Borrass, 2021). The key is transparent and evidence-based fiscal outlay management across procurement, distribution, and program administration.

In 2017, the Government of Ghana launched the Planting for Food and Jobs program as a flagship policy targeted at raising agricultural productivity and smallholder farmer

incomes sustainably to promote national food security and rural economic growth through holistic interventions spanning subsidized inputs, institutional capacity building, and better market linkages. (Ministry of Food and Agriculture, MoFA, 2017). However, historically, the country has seen several policy interventions and development projects in the agriculture sector, which, despite good intentions, were often unable to transform the livelihoods of smallholder farmers sustainably (Jaha, 2015). For instance, scholars have identified critical agricultural and rural development programs that preceded the PFJ initiative, spanning from the 1983 Medium-Term Stabilization Program to the 2006-2009, Growth and Poverty Reduction Strategy II, 2010-2013 Growth and Development Agenda, and Fertilizer Subsidy Program (FSP) (Banful, 2011; Tanko et al., 2019; Ansah et al., 2020). These past programs covered policy instruments like trade liberalization, input subsidies, credit provision, irrigation infrastructure investments, and agricultural research and extension strengthening. However, the empirical evidence indicates that these policy efforts did not lead to a substantial or lasting impact in terms of improving productivity, market integration, and incomes for the majority of Ghana's smallholder farmers, thereby failing to achieve stated objectives like alleviating rural poverty and raising living standards (Ansah et al., 2020; Amo-Asante, 2016; Jaha, 2015). Research by Ghana Statistical Service (2014) shows that between 2006 and 2013, the incidence of rural poverty barely changed, going from 38.2% to 37.9%, reflecting the lack of transformational outcomes from past agricultural development efforts for the country's small farms.

Scholars have identified interconnected constraints that limited past agricultural programs from effecting meaningful rural transformation (Wiemers, 2015; Diao et al., 2019; Banson et al., 2016). Key factors included the misalignment of technological solutions with varied farming cultural practices, leading to sub-optimal adoption rates (Kansanga et al., 2019). The prevalence of rigid administrative procedures also hindered farmer participation and financing inadequacies for programs to achieve impactful scale (Kansanga, 2017). Equally importantly, scholars point to lapses in political commitment and governance

practices that introduced distortions - misused allocated funds (Ansah et al., 2020), political favors overriding welfare goals, a disconnect between ground realities and program designs modeled on Western paradigms (Jaha, 2015), and over-reliance on external aid agencies' support. The limited involvement of local leadership in guiding policy also undercut community buy-in, which is essential for driving agricultural growth (Kansanga, 2017). These systemic capacity, resource, and governance limitations interlocked to constrain the success of past interventions to sustainably boost productivity, market integration, and incomes for Ghana's small farms inclusively.

Thus, the litany of challenges smallholders face, ranging from low productivity, high post-harvest losses, and weak market linkages, have persisted over decades of policy reform attempts. The failings indicate the need to rethink how agricultural development policies and programs are designed and administered in the Ghanaian context (Asamoah, 2017). In line with this, experts like Bamberger et al. (2010) have argued that instead of conducting just post-program failure analyses, the focus should equally be on instituting real-time monitoring mechanisms and periodic evaluation cycles during the lifespan of interventions. This approach can help identify teething issues and bottlenecks early during implementation and enable data-backed refinements before it is too late. The logic is that once programs derail significantly from intended objectives, it becomes difficult to retroactively rework program architecture, processes, coordination networks, and budget allocations and get buy-in from stakeholders for course corrections. Therefore, considering the checkered history of agricultural policies in Ghana, it would be prudent governance practice and project management not just to monitor the roll-out of the ambitious PFJ program but also to continually evaluate its performance against milestones framed during planning stages using evidence from the field (Tanko et al., 2019).

In other words, beyond output indicators like farmers enrolled, inputs distributed, the area cultivated, etc., evaluative research has to unpack whether intermediary outcomes and

beneficiary experiences match program goals around factors like technology adoption rates, market linkages established, income gains achieved, and ultimately, rural poverty reduction metrics (Danso-Abbeam et al., 2018). Any divergences detected through such institutionalized evaluation procedures between intended PFJ outcomes and actual achievement on the ground can help the government respond promptly with corrective mechanisms (Asamoah, 2017). With robust monitoring and evaluation frameworks, the PFJ program can be effectively assessed against its core objectives.

According to the Ghana Ministry of Forestry and Agriculture (MoFA) (2017), the key objectives of PFJ are job creation and promotion and strengthening market linkages for farmers. The belief is that all things being equal, the improved market linkage should lead to better economic performance for small-scale rural farmers, hence their ability to create jobs (Ansah et al., 2020; MoFA, 2017). The significance of this potential outcome is that job creation can help fulfill Goal 8, which focuses on promoting inclusive economic growth and decent work opportunities, which deals with the provision of decent work (Venkatesan & Luongo, 2019). Thus, the success of PFJ initiatives aimed at linking vulnerable small-scale rural farmers to remunerative markets is pivotal from not just the narrow lens of raising agricultural competitiveness but also the broader policy priorities around sustainable development and equality in Ghana (MoFA, 2017; Danso-Abbeam et al., 2018). Given the centrality of job creation and farmer market linkages to both PFJ's stated goals and the broader sustainable development priorities in Ghana, rigorous evaluation of program outcomes is essential to inform necessary refinements over time.

Moreover, public policy scholars have highlighted that development programs, especially in contexts of weak state capacity and governance systems, face embedded political economy risks that can entrench vested interests benefitting from the status quo, such as local elites, agricultural input dealers, large farmers, etc (Ansah et al., 2020). This tallies with research on Ghana indicating patronage politics and clientelism as binding constraints whereby programs operationally serve the needs of influential actors rather

than disadvantaged smallholders (Lindberg & Morrison, 2008). Therefore, beyond monitoring efficiency metrics, ongoing evaluation has to uncover if implementation processes exhibit course distortion from original social justice goals. For the PFJ program in particular, a critical success parameter is whether smallholder farmers are indeed the beneficiaries of improved production technologies, credit access, warehousing infrastructure, market linkages, etc., or is skewed resource allocation diluting the poverty reduction mandate. Periodic field audits can thus provide feedback loops for calibrating policies in an evidence-based, bottom-up manner to fulfill intentions like food security, equity, and sustainability. Therefore, it is crucial to conduct an empirical investigation using an independent mixed methods approach to determine the extent to which the PFJ program effectively implements its goals five years after its initiation, especially concerning small-scale rural farmer market linkages.

1.3 Problem statement

While the Planting for Food and Jobs (PFJ) program has been projected in political rhetoric as a panacea that can alleviate Ghana's checkered history of agricultural development policy failures, citizens still have reasonable doubt over such optimistic claims (Ansah et al., 2020). Especially from the lens of vulnerable small-scale rural farmers who have seen past interventions unable to sustainably transform their livelihoods (Bamberger et al. 2010), a critical marker of PFJ's success would be its ability to address prevailing market access barriers they face. The PFJ framework identifies facilitating farmers' participation in remunerative markets and strengthening marketing linkages as pivotal to ensuring increased production is not wasted (MoFA, 2017). It envisions enhanced warehousing, contract farming through institutional buyers, export channels, and financial services access, which will structurally improve tiny farm income realization, thereby making agriculture more economically sustainable (Danso-Abbeam, 2018). However, the extent to which this well-conceptualized design successfully

translates to on-ground outcomes, including small-scale farmers' market access and marketing linkages, remains unknown without investigatory efforts (Jaha, 2015). This research, therefore, seeks to investigate the effectiveness of the PFJ program in ensuring small-scale rural farmer market linkages and, consequently, the degree to which the PFJ program objectives are being realized.

1.4 Aim of the study

The research aims to make practical, policy, and theoretical contributions. In practical terms, this research aims to contribute towards (i) the success of the PFJ program, (ii) improved socio-economic well-being of small-scale farmers, their families, and communities, and (iii) job creation and poverty alleviation in rural Ghana. Theoretically, the study aims to enrich the body of knowledge on development program conceptualization and management with insights from the context of developing countries such as Ghana. Regarding policy, the study outcomes serve as a useful resource for development program policy formulation and implementation. Specifically, it provides information on the correctness or appropriateness of assumptions that policymakers often make about development programs that target the rural poor. To achieve this aim, the following specific objectives were set.

1.5 Research objectives

The research objective are as follows.

- Objective 1: Identify small-scale rural farmers support services and market improvements due to the PFJ programme.
- Objective 2: Identify key drivers of small-scale rural farmers market access and marketing linkages of under the PFJ programme.

- Objective 3: Determine the impact of market access and marketing linkages on the economic performance (profitability) of small-scale rural farmers under the PFJ programme.
- Objective 4: Identify small-scale rural farmers constraints to market access and marketing linkages.
- Objective 5: Suggest potential solutions to address challenges.
- Objective 6: Suggest ways to enhance and promote smallholder farmers market access.

1.6 Overview of the research methodology

This study utilizes a pragmatic mixed-methods approach, combining elements of contrasting research paradigms: positivism and interpretivism paradigm (Creswell & Creswell, 2017). This pragmatic perspective allows flexibility and openness to multiple viewpoints concerning the impact evaluation of the Planting for Food and Jobs (PFJ) program (Kaushik & Walsh, 2019). The exploratory study seeks to generate new insights where limited assessment exists (Creswell & Creswell, 2017). It is also descriptive, with farmers sharing experiences and cross-sectional, collecting data at a snapshot in time (Brierley, 2017). Both quantitative and qualitative research approaches were adopted in this study.

In the quantitative part of the study, the minimum sample size was computed to be 355 farmers based on a statistical precision estimate for the target population size and desired confidence level. However, the final sample was increased to 500 smallholder PFJ beneficiaries to account for potential incomplete survey responses (Brierley, 2017). This large sample aimed at supporting the generalizability of results. A multistage cluster sampling technique was implemented due to the large target region and population. First, given its high rural poverty rates, Ghana's Volta district was purposively selected. Next,

the Ho West district was singled out for its agricultural density and transport accessibility. Finally, 500 smallholders were randomly selected using systematic sampling from an enumerated roster frame obtained from the Ministry of Food and Agriculture (Brierley, 2017). On the other hand, in relation to the qualitative part of the study, a comparatively smaller purposive sample of 25-50 farmers was selected for interviews in order to zero in on information-rich cases. Participants were chosen based on established criteria, including willingness to share experiences and availability during the data collection period (Creswell & Creswell, 2017).

Additionally, structured questionnaires containing closed-ended questions with predefined response categories were utilized to gather numeric data on farmers' experiences with the PFJ program. On the other hand, semi-structured interviews containing open-ended questions were conducted with farmers to capture their subjective perspectives and detailed experiences with PFJ's benefits and shortcomings.

Key quantitative analytical techniques included Kendall's W coefficient of concordance to determine rankings and significance levels of the various production constraints faced by PFJ farmers were analysed (Diise et al., 2018). This enabled the prioritization of challenges like inadequate fertilizer access. Additionally, a multivariate probit model was leveraged to evaluate the influence of socio-economic, programmatic, and institutional factors on farmers' degree of access across several market domains, including product sales, pricing, transportation, and aggregation (Mittal & Mehar, 2016). In relation to the qualitative part of the study, detailed interview transcripts were analyzed using qualitative thematic analysis, which involved identifying and coding key themes related to PFJ's positives, such as income gains, and areas for improvement, like timing of input deliveries. Theme prevalence, intersections, and outlier perspectives were noted (Creswell & Creswell, 2017)

The informed consent process for smallholder beneficiaries of Ghana's Planting for Food and Jobs initiative emphasized voluntary participation and response confidentiality. Before survey administration, the research objectives and procedures were outlined, with anonymity assurances. Completed questionnaires contained no personal identifiers. Encrypted data was securely stored and accessed only by the study team. For qualitative interviews, transcript documents were kept on a password-protected cloud database without farmer names or contact information. By upholding principles of voluntary participation, informed consent, confidentiality, and respondent anonymity through data encryption and access restrictions, the evaluation methodology aimed to facilitate open and honest sharing of program experiences and perspectives by Planting for Food and Jobs beneficiaries in the Volta Region.

1.7 Delimitations of the study

While this study aims to provide valuable insights into the effectiveness of the Planting for Food and Jobs (PFJ) program in ensuring market access and marketing linkages for small-scale rural farmers, it is essential to acknowledge certain delimitations that define the scope and boundaries of the research. As PFJ aims to alleviate poverty for rural smallholder farmers across Ghana, selecting an informative region was imperative in delimiting the study's scope. The study was delimited to the Volta region of Ghana. According to the Ghana Poverty Mapping (2015) report, statistics on poverty levels in Ghana indicate that the Volta region had the third-highest rate of multidimensional poverty, affecting 35.2% of the population. Capturing PFJ's anti-poverty impacts here would thus indicate performance in a challenging socio-economic context.

Within Volta, the Ho West district offered ideal criteria for an agricultural case study, possessing high small farm density and relatively robust transport links (Ghana Districts, 2017). Its dense plantation coverage and productivity can be traced to the mountainous

topography and irrigation access from the Dayi River (Ghana Districts, 2017). Road access facilitated survey administration across Ho West's numerous farming villages. At the same time, delimiting the evaluation to this district provided focus on a quintessential example of Ghana's impoverished rural smallholder demographic, with insights more representative than an urban or less deprived setting may have afforded. Hence, selecting 500 PFJ beneficiaries in Ho West offered a strategic sample based on logistical considerations and the wider socio-economic marginalization that programs like PFJ strive to alleviate at the grassroots. Assessing indicative change here illuminates realistic livelihood upgrading potential for remote Ghanaian farm households through government assistance initiatives.

1.8 Limitations

A major limitation of the study was the narrow geographical scope. The study findings had constrained generalizability across the country by focusing solely on assessing PFJ outcomes in Ghana's Volta Region, specifically the Ho West District. Ghana possessed extensive agroecological diversity across its coastal, forest, savannah, and transitional zones. Consequently, predominant agricultural practices, dynamics of market integration, underlying constraints limiting smallholder commercialization, etc., varied greatly across locations. The experiences of beneficiaries captured through surveys and interviews in the Ho West district may not have fully represented ground realities for PFJ participants in northern cereal farming belts versus middle belt cocoa zones. Regionally differentiated program delivery mechanisms, infrastructure availability, and effectiveness of agricultural extension services also influenced outcomes.

The use of the cross-sectional time horizon was another limitation of the study. The pragmatist mixed methods evaluation relied on beneficiary perspectives and outcomes gathered at a single snapshot during Year 5 of the PFJ program. It did not track

longitudinal changes in their awareness, participation rates, income levels, or market linkages over the multiple years that households had been exposed to PFJ activities in the area. Smallholder experiences could have displayed great inter-annual variability depending on agroclimatic factors like rainfall, pest incidence, operational delays in input supplies, price fluctuations due to demand-supply gaps, consistency of extension services, etc. Their subjective perceptions were also shaped by recall limitations, making multi-year comparisons difficult (Smith & Sparkes, 2020). Therefore, the study could only ascertain the effectiveness of market linkage improvements under PFJ for beneficiaries at one point in time but did not elucidate evolutionary trajectories on key indicators.

Selection bias was another major limitation of the study (Knook et al., 2018). The study sample focused exclusively on farmers actively enrolled as beneficiaries under the PFJ program in the Ho West district. However, their overall positive outlook regarding PFJ's effectiveness in addressing market constraints versus struggling farmers who dropped out of the program after initially adopting suites of interventions or farmers who did not seek PFJ benefits at all - could have provided a more balanced perspective. Comparing experiences across these categories using quantitative indicators on market channel access, collective bargaining ability, etc., may have revealed on-ground dynamics limiting inclusivity. Another limitation is that the study focused on small-scale farmers, excluding medium and large-scale farmers. This limitation narrows the generalizability of the findings and the policy recommendations (Cohen, Manion & Morrison 2017). The Planting for Food and Jobs program affects farmers across different scales differently, and by not including medium and large-scale farmers, the study might not capture the full spectrum of its impact.

The study employed propensity score matching (PSM) for impact assessment, which has limitations. PSM helps address selection bias when evaluating the impact of interventions like the Planting for Food and Jobs program. However, it assumes that the selection into treatment or control groups is based on observable characteristics (Austin, 2011). One

limitation is that unobservable factors that might influence farmers' choices were not accounted for, potentially leading to bias (Austin, 2011). For instance, farmers' underlying motivations, risk preferences, and future investment plans can shape program adoption decisions but remain uncaptured. Additionally, data constraints meant that only a limited set of observable covariates were used in matching, relative to the many socio-economic factors that can confound participation (Benedetto et al., 2018). Other estimation methods, like instrumental variables, could address unobserved selection biases. However, finding appropriate instruments for program placement and participation is challenging. While PSM has benefits, the inability to fully account for unobservable farmer characteristics poses difficulties in determining treatment effects. Integrating qualitative insights on farmer decision-making around PFJ adoption can complement the quantitative findings.

1.9 Contribution of the study

This research makes several theoretical contributions that enrich understanding smallholder farmer behavior under agricultural development programs. It reveals the role of informal relationships, social capital dynamics, and localized norms in mediating beneficiary groups' responses to interventions, including material incentives. By highlighting likely gaps between policy visions, designs assuming rational profit maximization, and ground realities shaped by embedded socio-cultural institutions, the study provides analytical insights regarding achievability challenges facing well-intentioned state-led programs in developing contexts. Methodologically, combining macro and secondary data with micro-level primary data gathered through mixed methods enriches scholarly impact evaluation approaches. It facilitates multilayered analysis while upholding generalizability regarding program effectiveness.

The study also makes tangible, practical contributions to Ghana's flagship PFJ policy implementation. It offers a granular, field-driven assessment of which specific components of PFJ's market-oriented interventions have unlocked intended farmer commercialization outcomes versus where shortcomings exist to guide evidence-based refinements by agencies. By generating such diagnostics intelligence anchored in beneficiary perspectives, the research demonstrates methodological possibilities for participatory monitoring of large public social programs to uphold transparency and performance accountability. The study also offers an early-stage impact assessment of Ghana's flagship agricultural development program, Planting for Food and Jobs, based on farmer-centric metrics to shape ongoing efforts towards SDG 8 on economic growth and decent work.

Moreover, the findings inform coherent policy configurations required to sustainably improve small farm productivity, resilience, and market linkages in alignment with national development prerogatives. Furthermore, the analysis provides lessons for evidence-driven planning of agricultural development programs. Insights on appropriate targeting, sequencing, and clustering of interventions for optimizing synergy and marginal impact have policy relevance for not just PFJ but other emerging farmer-centric initiatives. More broadly, the research makes a case for institutionalizing ongoing, mixed-method evaluations of large public investments comprising feedback loops from citizens and beneficiaries. Embedding such impact assessment cycles can drive responsiveness, efficiency, and welfare gains from government social spending.

1.10 Structure of the thesis

The structure of the study is as follows: The first chapter offers an introduction to the research project as a whole. The explanation of the problem, the context in which the problem exists, the aim, objectives, scope of the study, and the limitation of the

investigation are all outlined in this section. Chapter 2 delves into the literature on Ghana's PFJ program, while chapter 3 focuses on the literature concerning small-scale farming businesses in rural Ghana. Chapter 4 emphasizes Ghana's small-scale farmers' access to markets. While Chapter 5 focuses on the theoretical framework that guides the study, chapter 6 captures the empirical literature and the conceptual framework. Chapter 7 details the study's methodology, and chapter 8 presents the results and discussions. In the concluding chapter, chapter 9, conclusions and recommendations are drawn based on the study's findings.

1.11 Chapter summary

The chapter introduces Ghana's flagship agricultural policy - the Planting for Food and Jobs (PFJ) program - launched in 2017 to raise smallholder incomes and productivity to ensure national food security. However, doubts persist over its real-world effectiveness and ability to transform vulnerable farmers' livelihoods, given the checkered history of past interventions. The research, therefore, investigates if PFJ is fulfilling its goals of facilitating market linkages to enable small-scale rural farmers to sell produce and thereby upgrade economic performance. It examines PFJ's support services, drivers, and constraints influencing farmer market access in the Volta Region using mixed methods combining surveys of 500 beneficiaries and 25-50 qualitative interviews. While findings focused on a single region have limited generalizability and time-bound data provides less insight versus longitudinal tracking, the study informs evidence-driven planning of agricultural development programs and policies to sustainably improve smallholder productivity, resilience, and market integration in alignment with Ghana's development priorities. It also demonstrates methodologies for participatory monitoring of large public social schemes to uphold transparency and performance accountability. The next chapter provides a comprehensive overview of the literature on the Planting for Food and Jobs



program, emphasizing the objectives, inputs, outputs, and outcomes in addition to assessing the effectiveness of market linkage goal.

CHAPTER 2: OVERVIEW OF GHANA'S PFJ PROGRAM

2.1 Introduction

The previous chapter provided an overarching perspective on the study: the background, aims, and problem statement, amongst others. This chapter focuses on a review of the relevant concepts in the study. Specifically, it provides an overview of Ghana's Planting for Food and Jobs (PFJ) program. This chapter is structured as follows: firstly, the objectives of the PFJ program are thoroughly discussed. After this comes an assessment of the market linkage objective of PFJ. The chapter also reviews the inputs, outputs, and outcomes of the PFJ program and concludes with a summary.

2.2 The PFJ program and objective

Agriculture, the backbone of Ghana's economy, plays a crucial role in achieving the second United Nations' Sustainable Development Goal (SDGs), ending hunger and improving nutrition (Lambongang, Ansah & Donkoh 2019). According to the Ghana Statistical Service (GSS 2017), nearly 40% of Ghana's active labour force is employed by the agriculture industry, which also generates revenue for the different businesses of the government. In light of Ghana's current population of 30.8 million, which is expected to grow by 2.1 percent annually (GSS 2021), the agricultural sector is highly expected to increase food production, especially in areas where there is widespread food insecurity, and also generate income and employment along all the value chain [Ministry of Food and Agriculture (MoFA, 2022)]. However, as important as this industry once was, subsequent growth and performance metrics have fallen short of expectations (GSS, 2017). This can be ascribed to the generally low agricultural productivity, which also risks people's livelihoods and the natural resources they rely on. Due to low productivity, most of the growth in agricultural output comes from extensification (land expansion), which is

neither sustainable environmentally nor addresses the problem of poverty and malnutrition (Jayne, Fox, Fuglie, & Adelaja, 2021).

Responding to this and several other challenges faced by the agricultural sector, Ghana's government implemented national objectives, policies, and programs. Evidence of this is the ratification of global and regional development initiatives, including the Millennium Challenge Development Goals, Sustainable Development Goals, and the Comprehensive African Agriculture Development Programme (CAADP) of the New Partnership for Africa's Development (NEPAD) (Appiah-Twumasi, 2019). These programs have been complemented with local- or national-level efforts such as Ghana's agricultural sector policies and programs, Food and Agriculture Sector Development Policy (FASDEP I and II), Medium-Term Agricultural Sector Investment Plan (METASIP I and II) and Fertilizer Subsidy program (Fearon, Adraki, & Boateng, 2015; Ministry of Food and Agriculture 2015; Appiah-Twumasi, 2019; Lambongang, Ansah, & Donkoh 2019)

While these policies and programs have made some positive strides in Ghana's agricultural sector, Ali, Agyekum and Adadi (2021) contend that the industry faced a slew of difficult issues that hampered the growth of agriculture in Ghana. For instance, despite the establishment of the Ghana Buffer Stock Company, smallholder farmers' access to the market and post-harvest management continues to remain a major challenge (Alam, et al., 2021; Abokyi, Strijker, Asiedu, & Daams, 2022). Furthermore, according to the Ministry of Food and Agriculture (2017), insufficient use of certified seeds, insufficient fertilizer application, a lack of extension services for farmers, weak ties between producers and markets, and limited use of information and communication technology have all contributed to a decrease in agricultural total factor productivity. In response to the challenges above, the government of Ghana, through the Ministry of Food and Agriculture, launched the Planting for Food and Jobs (PFJ) in April 2017, which is one of the government's flagship programs to speed up agricultural modernization and also structurally alter the economy (Ali, Agyekum & Adadi, 2021).

The PFJ program is a national agriculture policy to address food shortages and limit imports of some essential food crops (Ministry of Food and Agriculture 2017). The primary goal of the PFJ program is to encourage farmers to improve crop productivity by providing them with easy access to both input and output markets, thus creating employment possibilities in the agricultural value chain (Ministry of Food and Agriculture 2017). In its early stages, the PFJ focused on producing maize, rice, sorghum, soya, and vegetables (onion, tomato, and chili pepper). In 2018 and 2019, the program was expanded to include groundnut, cowpea, various root crops, and several other vegetable crops. In recent years, soy beans have remained the largest share of the benefits provided under the program (Pauw, 2022).

According to Linderhof et al. (2019), the program aims to increase the yields of important food crops by providing integrated services for farming and marketing. For instance, the Ministry of Food and Agriculture (2017) and Linderhof et al. (2019) reported that the food security of Ghana is expected to be improved through an increase in yield of some of the highly targeted food crops under the program, which include maize, rice, soybean, and sorghum by 30%, 49%, 25%, and 28% respectively. Ali, Agyekum, and Adadi (2021) asserted that this increase is expected to be achieved under the PFJ program through the provision of a 50% government subsidy on improved seeds, fertilizers, and extension services to smallholder farmers across the country to create an equal opportunity for farmers to assess farm inputs. Additionally, according to the Ministry of Food and Agriculture (2017), the PFJ program is expected to have an integrated electronic platform where farmers and related agribusiness firms can collaborate to assure dependable access to inputs (better quality seeds, fertilizer, and so on), financial services (such as loans), and markets for their products. Furthermore, by working with the business sector and other government agencies, including the Ministries of Health, Education and Trade and Industry (MTI), MoFA has advanced plans for a stable and ready-to-use market for agricultural products under the PFJ program.

Ghana's government is thus working to reverse declining agricultural sector growth by undertaking the Modernization of Ghana's Agriculture (MAG) Project, of which the PFJ is a crucial feature (MoFA, 2017). The PFJ program is important for modernizing agriculture and alleviating hunger, self-reliance, and poverty while creating new job opportunities. The PFJ program's precise objectives are as follows.

- I. To increase productivity and intensification of the production of some selected food crops to ensure self-sufficiency
- II. To help the unemployed, particularly young people in agriculture and allied fields, by creating employment opportunities (both formal and informal)
- III. To raise public awareness of the importance of cultivating cereals and vegetables on a farm or in a household garden.
- IV. To ensure immediate and adequate access to markets of selected food commodities (Ali et al., 2021).

2.3 The market access/ market linkage objective of PFJ

Access to markets for farmers is a fundamental requirement for market participation and is the main incentive for farmers' readiness to adopt and upscale production (Kyomugisha, Sebatta, & Mugisha, 2018). According to Agrilinks (2019), gaining market access and offering remunerative pricing is essential for the success of smallholder farmers because they provide the necessary demand and increase smallholder households' earnings. The proponents of this school of thought are adamant that gaining access to the market will lead to higher household incomes and food security, as well as more rural employment and long-term agricultural prosperity (Kyomugisha et al., 2018). However, smallholder farmers in Africa, including Ghana, have been unable to take advantage of recent increases in farm productivity because of several roadblocks such as poor road networks, lack of storage infrastructure, sub-standard quality of products

sold, and lack of market information that has prevented them from accessing the market in recent years (Thornsbury, Roberts, DeRemer& Orden, 2018; Agrilinks 2019).

The PFJ program's initiatives are anticipated to enhance crop yield and open up market space for farm products. According to MoFA (2017), this is driven by the specific objective of promoting the private sector's role in the trading, storage, and marketing of farm outputs and facilitating the forward and backward linkages between producers and commodity chain actors. According to the MoFA (2017), the strategy to increase market access for smallholder farmers includes building more food warehouses or storage facilities, adding value to fresh commodities, lowering price volatility, and connecting farmers to buyers. Others include increased raw material supplies for the food and animal feed sectors, the development of related industries, and the exploration and development of new local and internal market niches (MoFA, 2017).

2.3.1 Collection of outputs

According to the Peasant Farmers Association of Ghana (PFAG, 2019), farmers under the PFJ program have been employing three main outlets to sell their harvest produce: farmgate buyers/aggregators, market traders, and direct consumers. PFAG (2019) emphasizes that farmgate buyers constitute the most common channel used by PFJ farmers in the sale of their farm produce, followed by sale to market traders and, lastly, direct sale of products to consumers. This is mainly because there are poor road links between farms and cities, and the alternative is to transport harvested products by head-portage from farms to homes mainly by children and women over long distances, which can be unbearable (Asitik, Sharpley & Phelan, 2016). As a result, most farmers sell the produce at Farmgate at a meager cost (Asitik et al., 2016). Thus, it can be argued that although the PFJ seeks to improve market access by encouraging the involvement of private aggregators, the poor road networks make farmers under the program unable to

gain the full benefits from accessing markets that provide them with the market value of their produce.

2.3.2 Facilitation of storage infrastructures

According to PFAG (2019), farmers in Ghana suffer from reduced output primarily due to crop losses. This, according to MoFA (2017) and Ansah, Ehwi, & Donkoh (2018), is largely due to the lack of storage infrastructures such as warehouses where farm produce can be stored for some time while waiting for better prices and also to meet future food needs. However, it is estimated that this would be reduced to the barest minimum under the PFJ program because to increase market access, the program aims to renovate old warehouses and construct new ones through a public-private partnership. In fact, according to MoFA (2017), the PFJ seeks to rehabilitate 130 existing warehouses while constructing 86 new warehouses, each having a storage capacity of 1000 metric tonnes.

Reviewing the PFJ program, PFAG (2019) revealed from a survey that the majority of farmers, between 60% and 90% in the rural areas, who deal in grains like maize, rice, soybean, groundnuts, and sorghum stored part of their produce primarily in jute sacks while vegetables are sold immediately after harvest due to their perishable nature. The report further revealed that farmers did not have access to government or state storage facilities to patronize as they were virtually absent. Farmers further indicated that they were not aware of government-owned storage facilities or facilities subsidised by the government. On the contrary, Kale-Dery (2019) reported that the Minister of Finance indicated that the warehousing capacity has been increased from 27 warehouses with a capacity of 34,000 tonnes in 2017 to 160 warehouses with 160,000 tonnes in 2019 at vantage points to ensure that no farm product goes waste. The effect of this, according to MoFA (2019), is an unprecedented volume of food crops at the end of the 2018 farming season resulting in the export of a total of 150,000 tonnes of main food items to

neighboring countries, such as Burkina Faso, Ivory Coast, Togo, Niger, Benin, and Nigeria. This implies that while the government of Ghana has made significant strides in the provision of storage infrastructure to improve market access, there are several areas, especially within rural communities, where farmers fail to gain access to markets due to either the absence of storage infrastructure or lack of information on storage infrastructure within local communities which needs to be addressed.

2.3.3 Public food programs and services linkages

It is highly expected that the PFJ program will provide markets for private farmers and food aggregators in various public food programs. Specifically, the Ghana School Feeding Program (GSFP), Ghana Prisons Service (GPS), National Disaster Management Organization (NADMO), Food Fortification Program (FFP), and World Food Program (WFP) are just a few examples of public food programs that the PFJ program is expected to connect private farmers and food aggregators (MoFA, 2017). Additionally, it is expressed that storage warehouses would be expected from the Grains & Legumes Development Board (GLDB), where they have facilities that support the grading, sorting, processing, and packaging of outputs. Furthermore, since some private entrepreneurs, nucleus farmers, and FBOs are already engaged in the processing, packaging, and marketing of the farm outputs (including perishables like tomato, onion, and green chili pepper), engagement of these groups as commissioned aggregators could help improve the quality of the farm outputs and increase access to markets for PFJ beneficiaries (MoFA, 2017).

From the perspective of PFAG (2019), critical market linkages between farmers and potential off-takers such as processors, institutions, the National Buffer Stock Company, and school caterers under the School Feeding Programme do not receive their supply from PFJ. Consequently, Critas Ghana (2018) highlighted that several School Feeding

Programme caterers import foodstuffs such as rice and tin tomatoes to feed school children. Similarly, other public institutions such as Ghana Prisons Service (GPS), National Disaster Management Organization (NADMO), and international organizations such as Food Fortification Program (FFP) and World Food Program (WFP) have not benefited from PFJ market linkage.

It can, therefore, be inferred that the PFJ program's objective of achieving adequate market access through farmers and potential off-takers such as processors and other public institutions has largely been unachieved. This could be due to a lack of proper collaboration and enforcement of policies in support of public institutions' procurement of produce from farmers under the PFJ.

2.3.4 Linkages with the animal feed industry

Although there are feeds for different livestock in Ghana, poultry feed constitutes the largest share, representing 70 percent of the total animal feed (Netherlands Enterprise, Agency 2019). The constituents of feeds are mainly corn, which constitutes 70%, rice, 20%, and sorghum, which constitutes only 10% due to its high cost (Bickford, 2019). It implies that food crops like corn, rice, and soybeans can significantly enhance value in the animal feed business. However, the growth of the domestic poultry industry is hampered by a lack of basic inputs, such as yellow maize and soya cake, which forces consumers to look abroad for more affordable broiler options (MoFA, 2017). It is therefore anticipated that the program will help farmers, aggregators, and others in the animal feed supply chain gain access to the market by facilitating direct connections between them and other participants in the chain, such as food processors and, private animal feed companies and poultry farms.

Commenting on the PFJ program, the Ghana Poultry farmers association (2021) indicated that although significant gains were made in the production of these grains, which are raw materials for animal feed, it did not benefit the industry much as a greater portion of these grains were exported to neighbouring countries such as Mali and Burkina Faso due to high prices offered. Also, Berkhout (2021) asserted that torrential rainfall and the spillage of the Bagre Dam in Burkina Faso in 2020 destroyed almost 4,000 hectares of maize, over 550 hectares of sorghum, and over nine hectares of soya beans, which were the primary raw materials for animal feed.

Thus, it can be argued that even though the planting for food and job program increased the production of grains for the benefit of animal feed, the Ghanaian animal feed industry did not benefit much compared to neighbouring countries. This problem was further worsened by the destruction of large hectares of grain, which limited the availability of these grains to the animal feed industry as demand for human consumption kept rising.

2.3.5 Price volatility

The availability of commodities that are the focus of the PFJ program varies seasonally because of harvesting, planting, unpredictable weather patterns, transportation, and the demand for feed (MoFA, 2015). Although the program is likely to lead to a significant increase in the total amount of food produced, the base pricing of the targeted crops may change, making market accessibility difficult. In addressing the potential challenge of price volatility, the PFJ planned to use strategies such as (a) negotiating to establish agreements between producers and buyers with economic clauses that could be equitable to both parties in a volatile market, (b) engaging the National Food buffer Stock Company (NAFCO) in stabilizing prices via national stockpiles and buffer stocks facilities with clearly defined policies that will alleviate the volatility (c) encouraging producers to add value to their products, (d) forming comprehensive partnerships with various

commodity stakeholders through incentives and joint ventures in order to increase participation in the commodity value chain and (e) getting farmers and buyers to use tools for managing financial risks such as the purchasing of insurances to reduce risk of price volatility (MoFA, 2017).

Despite these measures, price volatility has been relatively high since 2019. This is due to the disruption of the supply chain during the Covid, which made it impossible for farmers to readily access key inputs such as fertilizers from outside the country, pushing up the price of the limited number available. The result is that very few farmers could buy these fertilizers at such a high price. This caused a reduction in the volume of food produced, consequently raising the price of foodstuffs, negatively affecting market access.

2.3.6 Processing and value development of private businesses

According to the MoFA (2017), it is expected that companies, research institutes, small enterprises, and people will be encouraged to develop and market new products (recipes) based on local crop outputs. Stabilizing the market for each product while simultaneously creating new jobs and bringing in additional revenue are all possible outcomes of such initiatives. Additionally, the PFJ intends to help local businesses that use innovative packaging and branding techniques for value-added products to expand. The One-District-One-Factory project, another government of Ghana initiative, is expected to benefit from such marketing efforts. Examples of private processing and value businesses taking advantage of the Planting for Food and Jobs program are Ekumfi Fruits and Juices Processing Factory, Casa de Ropa Factory, and Petersfield and Rey Factory (The Ghanaian Chronicle, 2020). It can be argued that private businesses, including some companies under the One-District – One Factory programs, have improved market access for farmers under the PFJ program.

2.3.7 New market niche exploration and development

The current PFJ target crops in West Africa have a wider market potential because of their wide range of uses (MoFA, 2020). As a result, companies that are already export-oriented and newcomers with established markets will be helped by the PFJ in their quest to find niche markets for local products. The Export Promotion Council of Ghana and the Ministry of Trade are expected to promote Ghana's exports. Other niche international markets are projected to be explored through the PFJ as well to encourage exports and improve the well-being of smallholder farmers who are the beneficiaries of the pivotal project.

Domestic markets for farm products and processed foods are also expected to be developed by private marketing firms and the Agribusiness Support Unit (ASU) in conjunction with the Women in Agricultural Directorate (WIAD) (MoFA, 2019). According to the MoFA (2021), significant progress has been made with the development of new markets, which is a key component of the access to the market under the PFJ. Evidence of this is the export of a total of 150,000 tonnes of main food items to neighbouring countries, such as Burkina Faso, Ivory Coast, Togo, Niger, Benin, and Nigeria (MoFA, 2019). The implication is that the farmers under the program now gain new markets where their farm produce can be sold at competitive prices, creating foreign earnings for the country.

2.4 PFJ program inputs

Inputs are significant resources that are invested to achieve the program objectives. On the contrary, inputs could also become barriers that could hinder the successful implementation of the program objectives (Shakman & Rodriguez, 2015). The PFJ group inputs under two main categories, PFJ implementation strategy and PFJ implementation

barriers. The PFJ implementation strategy includes resources such as human, financial, material, space, and external partners. The PFJ implementation barriers include trade barriers, rural customs, and the attitudes of program officials. These inputs are discussed in detail in the next section.

2.4.1 PFJ implementation strategy

This section describes and discusses the implementation strategy adopted for the PFJ. The strategy consists of the following components: human, material, external partners, trade barriers, rural customs, and attitude of program officials.

2.4.1.1 Human

The human component of the strategy concerns the following elements.

2.4.1.1.1 Extension Agents

Extension agents are responsible for ensuring that extension services function properly. Extension service facilitate farmers access to information, technologies and education (Food and Agriculture Organisation (FAO), 2010). As such, extension agents are human resources for improving the efficiency and effectiveness small scale agricultural businesses under the PFJ (Danso-Abbeam, Ehiakpor, & Aidoo, 2018). As a major human resource input for the PJF, extension agents are expected to improve the reach and impact of the PFJ program by providing higher-quality and more frequent extension services in various technical and non-technical service markets (MoFA, 2017; MoFA, 2021).

Owing to the critical role of this input, at the commencement of the PFJ program in 2017, the extension directorate of the Ministry of Agriculture and Fisheries (MoFA) anticipated

a need for 4,000 Agriculture Extension Agents (AEAs) across the 216 districts, where only 2,600 AEAs were already working (MoFA, 2017). Accordingly, 858 AEAs were recruited by the Ministry of Food and Agriculture and deployed across various districts in the Ashanti (21.9%) and Brong Ahafo (14.2%) regions, as well as Central (4.1%) and Eastern (10%) and Greater Accra (3.4%) regions. The rest included Northern (14.1), Upper East (8.5%), Upper West (8.8%), Volta (5.5%) and Western (8.9%) regions. By the end of 2021, the total number of extension officers had increased to 4,286, and the ratio of extension officers to farmers had reduced from 1:1900 to 1,709 extension agents (MoFA, 2021).

It can, therefore, be argued that the PFJ program has made a significant contribution to human input in relation to extension officers, which is expected to help provide the key technical support needed to increase production and achieve project goals. There is, however, some room for improvement to ensure the needed extension service reaches all farmers in the country.

2.4.1.1.2 National, regional and district technical committees

The Ministry of Food and Agriculture is the organisation in charge of carrying out the PFJ initiative (MoFA, 2017). The program's implementation structure is comprised of three tiers: the National Technical Committee (NTC), the Regional Technical Committee (RTC), and the District Technical Committee (DTC). The Deputy Minister of Agriculture in Responsibility of Crops, Regional Ministers, and Metropolitan/Municipal or District Chief Executives chair these three committees, respectively. At the national level, the NTC makes key decisions about the program's future development. The RTC and the DTC are accountable for the program's day-to-day operations, which they are tasked with executing based on their respective levels of authority and jurisdiction.

According to the Ministry of Food Agriculture (2017), the DTC's responsibilities include the formulation of seasonal and annual operational plans and the organisation of private- and public-sector actors and supporters to assist in implementing these plans. In addition, the DTC is tasked with the responsibility of coordinating support for the implementation of these plans. They are also tasked with monitoring the day-to-day activities, continuously analysing and managing any risks and threats, and reporting their findings to the RTC every month, among other responsibilities. In a nutshell, the members of the Technical Committee at the respective levels of the tier play the lead role in tracking the progress and providing advice and counseling to stakeholders on implementing the various activities across the various value chains (MoF A, 2017).

2.4.1.1.3 Farmers

Different farmer groups in the 216 districts in the country were targeted as very important human resource input in the PFJ program. The first targeted group consisted of individual farmers who have been successful and are willing to exhibit their methods and also encourage their peers and other farmer organisations to adopt them (MoFA 2017). Another targeted group of farmers are the nucleus farmers which refers to the principal farm operators who frequently lend a helping hand to the smallholder farmers in the area by acquiring the necessary agricultural inputs and marketing the finished crop products (MoFA, 2017). Another key targeted group are Farmer-based organisations (FBOs) that describe registered organisations that have the ability to organise groups of smallholder farmers united by a desire to raise their productivity and profits (MoFA 2017). Lastly, the PFJ also targeted institutions like churches, tertiary education institutions, the Ghana prison services, and hospitals.

During the initiation of the PFJ program in 2017, it was expected that a combined total of 10 FBOS, 100 nucleus farmers, and 200,000 direct farmers would be registered to participate in diverse agricultural endeavors. According to the Ministry of Food and

Agriculture (MoFA), in 2017, there was a projected increase of 2000 FBOs (Farmer-based organizations), 5,000 nuclear farmers, and 1,500,000 direct clients by 2020. The number of farmers who benefited in 2017 exceeded the aim, with 202,000 beneficiaries, surpassing the goal of 200,000 farmers (MoFA, 2017). In the same vein, the predetermined figure for 2018 was surpassed. The recorded total of farmers is 677,000, exceeding the projected target of 500,000. The number of recipients in 2019 and 2020 were 1,183,000 and 1,736,510 farmers, respectively, surpassing the corresponding targets of 1,123,500 and 1,682,000 farmers (MoFA, 2017; 2019; 2020).

Additionally, as a result of the PFJ working with the Ministry of Education in promoting the establishment of food farms in high schools (FOFAS), a total of 160 senior high schools (SHS), ten public and private universities got involved with the program (MoFA, 2019). Other organizations, including prisons, military, churches, and hospitals, also assisted in cultivating various crops in 2017 and 2018 (MoFA, 2019). This consistent overachievement of intended beneficiary targets across the years indicates the expansive scope and uptake of the Planting for Food and Jobs program nationwide. If managed effectively, this level of mobilization and enrollment presents substantial potential to transform livelihoods and upgrade incomes and food security for hundreds of thousands of Ghanaian farmers. The extensive enrolment numbers surpassing initial PFJ targets indicate wide adoption across Ghana. This presents a major opportunity to fulfill the program's transformative vision for uplifting smallholder farmer livelihoods nationwide.

2.4.1.1.4 Crop researchers and scientists

At the core of the Planting for Food and Jobs agenda of raising farmer productivity and incomes is the need for high-quality seeds of improved, high-yielding varieties to enhance agricultural output and resilience (MoFA, 2017). Critical to the development and validation of such locally suitable cultivars are crop scientists and expert plant breeders based at specialized research institutes across Ghana (MoFA, 2017). These human resources or

inputs possess deep insights into the agronomic traits, yield potentials, and cultivation requirements of both traditional staples and modern varieties. Their technical expertise makes it possible to breed locally adapted, stress-resilient, nutritionally-rich cultivars tailored to thriving in Ghana's varied agro-ecologies - an endeavor central to the PFJ's agricultural transformation vision. However, a persistent lack of locally developed germplasm over the years has resulted in the seed system continuing to rely heavily on varieties bred to thrive mainly in foreign environments rather than local conditions (MoFA, 2017). To change this status quo, the contributions of crop researchers and scientists as key human resource input are critical to propagating purified seeds of traditional regional staples through formal certification channels.

Several specialized crop breeding institutes and research centers have driven the development of quality breeder seeds distributed under the PFJ program. The West Africa Centre for Crop Improvement (WACCI) at the University of Ghana has provided crucial human capital inputs, with its plant scientists possessing advanced expertise in developing high-yielding and resilient hybrid maize cultivars suited to local conditions (MoFA, 2019). Similarly, sorghum breeders at the Sorghum Crop Research Institute leverage their deep knowledge of this traditional staple to supply improved Sorghum seed varieties catering to Ghanaian farmers' needs (MoFA, 2019). Soybean specialists at the Savannah Agricultural Research Institute focus on enhancing this oilseed crop's productivity potential and stress tolerance. Additionally, rice and maize breeders based at the Crop Research Institute in Kumasi drive genetic improvements in these cereals to make better-quality seeds available for farmers enrolled under PFJ campaigns (MoFA, 2019). The Asian Vegetable Research and Development Center has also contributed its technical skills in developing productive and nutritious vegetable varieties aligned with consumer preferences in Ghana (MoFA, 2019).

2.4.1.1.5 Community and opinion leaders

Community and opinion leaders represent critical human capital foundations enabling the decentralized outreach and localized buy-in essential for the Planting for Food and Jobs (PFJ) program to achieve extensive grassroots-level adoption. Recognizing the substantial authority and social influence these leaders wield at district and village levels, PFJ implementation committees proactively engaged them to share program details and enrollment information (Jones & Michael 2011). This helped spread awareness to remote areas. Several categories of influential leaders played pivotal mobilization roles - religious heads like pastors, imams, and traditional leaders leveraged their moral standing to encourage participation; educationists such as teachers and progressive farmers helped explain PFJ's technical packages; health workers and political representatives also articulated expected welfare benefits through their networks.

Additionally, consultations with custodians of communal lands, such as chiefs and family heads, were vital, resulting in tracts being allocated for cultivation under PFJ schemes. Such actions aligned with cultural institutions' development agendas. Given high levels of rural community trust in figureheads, their visible endorsement granting land access provided social legitimacy for PFJ at the grassroots, interpreted as validation of the program's benefits (Antwi-Bediako, 2018; MoFA, 2017). This facilitated behavior change and adoption by common farmers who often resist new government extensions before noticing perceptible gains for leaders. Thus, community authorities' guidance was indispensable in overcoming likely skepticism, rumor-mongering, or misconceptions in remote areas, enabling smooth PFJ expansion. Constructive engagement with influential leaders at multiple tiers formed a crucial foundation facilitating the Planting for Food and Jobs program's ability to enroll over a million smallholder households within two years of the program implementation (MoFA, 2017).

2.4.1.1.6 Financial

The financial outlays and allocated expenditures underpinning the Planting for Food and Jobs (PFJ) program reflected its ambitious objectives and vast intended coverage. Realistic budget planning and disbursement monitoring were essential given the substantial investments in procuring inputs, upgrading infrastructure, deploying extension services, and administering operations needed to service millions of smallholder farmers annually across Ghana.

The initial budget estimate for the PFJ program was a total of GH¢ 3.3 billion over four years (MoFA, 2017). Out of this amount, about 50% was allocated to fertilizers, 27% went to seeds, and 8% was allocated to extension service and marketing, with the rest taking care of the e-agriculture (see Table 2.1). In contrast, the cost of subsidized fertilizers to the farmers accounts for a more significant majority of the total budget, while e-agriculture accounts for the least.

Table 2.1: Estimated cost of the PFJ by Pillars from 2017-2020

Pillar	GH¢	US\$
Seed	908,062,490	197,404,889
Fertilizers	1,842,504,980	400,544,561
Extension Services	277,741,800	60,378,652
Marketing	277,741,800	2,210,400
E-Agriculture	28,980,000	6,3000,000
Total	3,335,031,070	723,538,502

In relation to financing the PFJ, the government of Ghana remains the major contributor, although there is support from other international donors such as the Canadian government and local donor organisations. The Agricultural Development Bank (ADB), which is a local bank in Ghana, has also provided an amount of GH100 million to support the government's Planting for Food and Jobs program and other initiatives under the Agricultural sector (Effah, 2019).

2.4.1.2 Materials

The overarching strategy of the PFJ program is to significantly increase the availability of inputs and make it easier for output to gain access to markets (MoFA, 2017). Therefore, the central mechanism that is the program's primary focus is the facilitation of the adoption of inputs, good agronomic practices, and output marketing through an integrated e-agriculture platform. In this regard, the availability of seeds and fertilizers makes up a very critical material input for the PFJ programs. The following sections address these two key material inputs.

2.4.1.2.1 Seeds

The supply of high-quality seeds is crucial for agricultural development (Abebe & Alemu, 2017). According to Azumah et al. (2019), access to quality seeds is the core lifeblood of agriculture and the foundation of successful farming for smallholder crop producers in the dryland tropics. As a result, access to quality seeds is a major cornerstone of the PFJ program. The PJJ program strategized to encourage private firms, certified seed companies, and agro-input dealers to produce appropriate amounts of high-quality seeds in accordance with the dictates of the market to support the program (MoFA, 2017). Additionally, it planned to make the timely delivery of certified seeds at 50% subsidised prices to the intended recipients through public and private outlets.

According to Pauw (2021), in the first year of the PFJ, maize, rice, sorghum, soya, and vegetables (onion, tomato, and chili pepper) seeds were provided to the farmers, while in 2018 and 2019 groundnut, cowpea, other root crops, and further vegetable crops were introduced. A total of 4,400 metric tonnes of certified cereals and legumes (maize, rice, sorghum) seeds was available to farmers in 2017 when the initiative was established; this included four metric tonnes of vegetable seeds (tomatoes, onion, and pepper). Total seed distribution for various crops in 2018 was around 7,500 metric tonnes. This included everything from groundnuts to vegetables (lettuce to carrots to cabbage) (Pauw, 2022).

According to Ibrahim (2017), about 80% of the PFJ seed supply was imported in the program's first year. This according to Pauw (2021) was because although local seed production could theoretically supply 60% of PFJ's seed needs, this shortfall was probably attributable to procurement and logistics issues. Subsequently, in 2018, Pauw (2022) indicated that there was a huge growth in domestic seed output, which outpaced the demand for PFJ by a large margin. However, in 2019, the demand for PFJ seeds outstripped domestic supplies once again.

Although the PFJ has made some significant achievements in terms of giving farmers access to quality seeds, the performance in terms of supply of some crop seeds has been below average. For instance, Pauw's (2022) assessment of the seeds supplied for the period revealed that only 10% of the sorghum seed has been dispersed, and the distribution rate for the remaining crops ranges from 42-67%.

Table 2.3: Quantities and types of seeds required for the PFJ program

Seed Class	Crop/ Year	Maize (OPVs)	Maize (Hybrids)	Rice	Sorghum	Tomato	Onion	Chilli pepper	Soya bean
Certified Seed (tons)	2017	1339	638	700	0.0	1.2	1.2	1.2	-
	2018	9114	4340	6231	1184.9	6.8	18.2	2.5	3150
	2019	17753	8454	12377	2501.5	13.0	37.2	4.0	6650
	2020	18617	8865	12992	2633.2	13.6	39.1	4.2	7000
Basic Seed (tons)	2017	20	-	10	-	0.004	0.008	0.006	-
	2018	134	-	92	13.9	0.020	0.125	0.012	231.6
	2019	261	-	182	29.4	0.038	0.256	0.020	489.0
	2020	274	-	191	31.0	0.040	0.269	0.020	514.7
Breeder Seed (Kg)	2017	351.6	-	183.8	-	0.013	0.069	0.034	-
	2018	2393.4	-	1636.4	199.1	0.071	1.048	0.073	20.7

2019	4662.1	-	3250.4	420.4	0.137	2.137	0.117	43.7
2020	4889.0	-	3411.8	442.6	0.143	2.246	0.122	45.9

2.4.1.2.2 Fertilizer

Low fertilizer usage partly accounts for poor farm productivity in Ghana (Holden, 2019). To solve this problem the PFJ program focuses on fertilizer access to farmers through a subsidy system. According to MoFA (2017), this approach is driven by the underlying goal of increasing volumes of fertilizer usage in the PFJ program.

The actual number of fertilizers supplied in metric tonnes for 2017 was 297,000 against the planned figure of 40,763 (MoFA, 2017). Similarly, in 2018, 320,841 metric tonnes of fertilizers were supplied under the program instead of the planned 247,039 metric tonnes (MofA, 2019). However, in 2019 and 2020, the actual amount of fertilizers supplied was far less than the plan, that is, 331,348 as against a planned 632,037 and 423,473 metric tonnes as against 663,157 planned (MoFA, 2020; 2021) (see figure 2.5). The gap in fertilizer supply for 2019 and 2020, among other things, could be attributed to the disruption in the supply chains during the COVID-19 pandemic, which limited supplies and consequently resulted in a sharp price increase. In order to ensure improvement in fertilizer supplies, storage facilities were also established across essential locations of the country to store appreciable quantities adequate for specific production seasons of the year.

Commenting on the above, it is evident that the PFJ has achieved a significant milestone in the supply of fertilizer as a critical program input. However, the decline in the supply in 2019 and 2020 threatened the initial gain in the project. Therefore, it is essential to promote the use of natural alternatives such as compost to ensure sustained productivity.

Table 2.4: Fertilizers distribution through the PFJ program (1 bag = 50 kg).

Crop	Maize	Rice	Sorghum	Soya bean	Tomato	Chilli pepper	Onion
NPK (bags/ Ha)	5	5	5	-	5	5	5
Urea or Sulfate of Ammonia (bags/ Ha)	2.5	2.5	3	-	2.5	2.5	2.5
Bio-fertilizer	-	-	-	3	-	-	-

Table 2.5: Projected fertilizers (tons) requirements under the PFJ program

Fertilizer/Year	2017	2018	2019	2020
NPK	27,175	198,119	388,056	407,050
Bio-fertilizer	-	11,813	24,938	26,250
Urea or Sulfate of Ammonia	13,588	110,909	219,043	229,857

2.4.1.2.3 Space/ acreage

The official PFJ targeting criteria (MoFA, 2019) state that beneficiary farmers should be resource-poor smallholders with holdings between 0.4 and 2.0 hectares apart from a willingness to participate. Thus, to be qualified to participate in the program, farmers must have between 0.4 and 2.0 hectares of land available for farming.

2.4.1.3 External partners

The Planting for Food and Jobs (PFJ) program has benefited from substantial financial and technical assistance from several international development partners. The Czech Republic Export Bank provided a €20 million credit line primarily for procuring compact tractors and power tillers to enhance smallholder mechanization under PFJ (Embassy of Czech Republic, 2020). The Canadian government has been another major contributor, granting CAD 120 million to build long-term institutional capacities surrounding PFJ policy

planning, research, and extension services across Ghana's farming belts (MoFA, 2022). At more localized levels, South Korea is investing \$9 million to uplift Central Region districts through integrated production infrastructure and farmer collective promotion. China has supplied concessional lines of credit facilitating fertilizer imports to ensure steady availability for PFJ beneficiaries amidst high global prices (Bokpe, 2017). Such wide-ranging financial and operational level collaborations with international, private, and public sector partners have been invaluable for the Planting for Food and Jobs initiative - plugging crucial investment, knowledge, and service delivery gaps while leveraging partner competencies to maximize program outcomes on the ground.

2.4.2 PFJ implementation barriers

There are several implementation barriers to the PFJ program. Some of these include importation barriers placed on certain products, such as seed production and fertilizer production, as well as specific import quotas of tariffs to reduce imports of such products into the country (MoFA, 2019; Mohammed, Salifu & Saeed, 2019; Chapoto & Ragasa 2013). Such strategies are expected to make local private and public firms that are into producing these items more competitive and empower them to enhance their productivity and increase their revenues (Pauw, 2022; MoFA, 2019). For instance, regarding seeds, the government invested 908.1 million, representing 29.6%, to boost the local seed production through the PFJ to ensure the availability of quality seeds to smallholder farmers who are direct beneficiaries of the program. Some other barriers to implementing the PFJ program, such as the role of rural customers and the attitude of program officials, in addition to tariffs and import quotas, are discussed below.

2.4.2.1 Trade barriers

Several trade barriers could potentially inhibit the smooth implementation of the PFJ. These could include poor road infrastructure, extremely high standards requirements for

some products to meet the standards of certain export markets, and export restrictions of certain products (Pauw, 2022). The poor road infrastructure restricts access to certain producing areas, reducing the quantity of produce that can be obtained from these areas, ultimately reducing the total quantity of output required to ensure food self-sufficiency and reduce food insecurity (MoFA, 2020). It could further increase post-harvest losses, potentially increasing food insecurity and reducing farmers' incomes. However, effective and regular negotiations with importing countries and other local industries are essential in reducing these barriers. In addition, facilitating the rehabilitation and ensuring the motorability of most feeder roads in major producing areas is key to reducing this barrier (Mohammed, Salifu & Saeed, 2019).

2.4.2.2 Rural customs

Certain rural customs can potentially hamper the effective implementation of the program and these need to be identified and necessary action put in place to ensure their effect is reduced substantially. These include gender-based traditional values within rural societies, which sometimes preclude the effective participation of women farmers from actively engaging in the program (Chapoto & Ragasa, 2013; Nchanji & Bellwood-Howard, 2016; Mohammed et al., 2019). This could be in areas such as access to land and other productive resources where women are not allowed to assess these inputs unless they obtain them through their husbands, which presupposed that until the husband is interested and thus facilitates access to such resources, such women may not potentially participate in the PFJ (Haleegoah et al., 2020; Ragassa et al., 2013; Bawa & Sanyare, 2013; Sossou & Mbaye, 2018).

Traditional customs, such as taboos, could also be a major barrier to the implementation of the program. One such taboo includes not going to the farm on certain days of the week, which could obstruct key farm activities that are time-bound and require urgency, such as spraying. The 5-day menstruation period during which women are not allowed to go out could also be a barrier to the implementation. Women may be unable to visit their

farms even in an emergency (Haleegoah et al., 2020). It, is expected that the initial engagements and discussions with traditional leaders in rural communities and opinion leaders, as well as general community sanitation and advocacy on the need to enhance women's access to these resources, will potentially reduce such occurrences and ensure effective program implementation.

2.4.2.3 Attitudes of program officials

The politics surrounding agricultural interventions, especially input subsidy programs, are complex, with equity and transparency risks (Banful, 2011; Jayne & Rashid 2013; Takeshima and Liverpool-Tasie, 2015). Marginalized groups like youth, women, and poorer farmers often face barriers to accessing advertised benefits. Voucher allocations reflect power structures, allowing well-connected middlemen to corner subsidies. Such unevenness encourages corruption among officials who exploit information asymmetry and administrative discretion for self-gain. Additionally, in most societies of Ghana, despite constitutional provisions ensuring gender equality, social norms impose participation barriers - limiting women's decision-making power, mobility, and access to productive resources like land, credit, and extension services relative to men (Bawa & Sanyare, 2013). The engrained norms discourage women from actively voicing concerns, allowing elite capture to persist unchecked at the grassroots. Therefore, the capability approach offers an incisive theoretical lens examining impact variations for PFJ - assessing whether subsistence farmers have genuine access to advertised interventions or lived socio-political realities restrict fundamental freedoms to achieve enhanced agricultural productivity and food security.

2.5 PFJ program outputs

Outputs are what the program does with inputs to achieve goals. The output of the PFJ is categorized into two main groups, which include the interventions and the PFJ

audience. Activities like events and workshops, shows, informational materials, and training advice constitute interventions in program logic (Shakman & Rodriguez, 2015), while the audience comprises small-scale rural farmers. Some of these outputs are discussed below.

2.5.1 Trade expos

As part of the outputs, trade expos will be organized on the produce and outputs from the PFJ, which is expected to bring together key actors of the commodity value chain in Ghana. Such programs will involve major program actors such as farmers, processing industries, aggregators, exporters, and other entrepreneurs who might identify agribusiness opportunities at the expos. Furthermore, it will open up the farmers and stakeholders to both local and international networks, which can enhance and boost the incomes of program stakeholders.

2.5.2 Training

Another important output of the PFJ is training. Training is expected to be organized for major beneficiaries, facilitators, and stakeholders of the PFJ program, including extension agents, district officers, and Directors of MoFA. The others include agro-input dealers, output off-takers, fertilizer-producing enterprises, transporters, etc, in order to bring them to the same level in terms of the purpose of the program. The rationale is to ensure the effective transfer of relevant information across the chain toward the achievement of the market linkage objectives of the program. In addition, training of these stakeholders is expected to ensure effective program implementation through correctly understanding the responsibilities and criteria for participation (Pauw, 2021). In addition, regular technical training on certain improved techniques by extension staff, input dealers, and farmers on improved production techniques and safety techniques (MoFA, 2020; Mohammed et al.,

2019) is also organized to enhance productivity and achievements of the program's purpose.

2.5.3 Advisory services

Advisory services are another vital output of the PFJ. Major advisory services are obtained through the MoFA, Research institutions (Crops Research Institute and Savanna Agricultural Research Institute of the Council for Industrial Scientific Research (CSIR – CRI and CSIR – SARI) and delivered through extension agents to farmers. The aim is to provide practical advice on production, post-harvest, and marketing advisory services to farmers. Also, other advisory services are provided to agro-input dealers, seed producers, and fertilizer producers, who are also central to the effective implementation of the program. These include advisory services on implementation guidelines from policy perspectives, technical advisory services, financial advisory services, etc., with the prime purpose of enhancing the smooth implementation of the program and, at the same time, ensuring that these actors are reaping the maximum benefits from the implementation process (MoFA, 2019).

2.5.4 Informational materials

Another key output of the PFJ program is information materials. In order to ensure effective and smooth implementation of the PFJ and for the key beneficiaries to derive maximum benefits, strategies such as training and advisory services were complemented with the supply of appropriate informational materials. Such informational materials include policy briefs, fact sheets, flyers, and others (MoFA, 2020; Pauw, 2021; Mohammed et al., 2019). Furthermore, such materials were prepared to focus on specific areas of the implementation, including fertilizer, planting, harvesting and postharvest, and marketing. They were distributed to farmers and other relevant stakeholders of the PFJ.

Additionally, these materials seek to ensure a smooth flow of relevant information to increase productivity and market linkages among farmers. In order to ensure the quality and relevance of these materials, appropriate stakeholders such as the MoFA, research institutions, NGOs, and other private organisations were tasked to develop these documents (Pauw, 2021).

2.5.5 Small scale rural farmers

The only audience output of the PFJ is small-scale farmers, who are the key beneficiaries of the program. Small-scale farmers are pivotal to the program's implementation because they are the direct beneficiaries from the implementation viewpoint. The focus is on small-scale farmers because they constitute about 80% of the total farmers in Ghana and produce about 90% of the total crop outputs in the country (MoFA, 2019). All the activities of the program revolve around the small-scale farmer. Thus, the number of small-scale farmers reached is essential to successfully implementing and achieving the program objectives.

A key mechanism for extending benefits to enrolled smallholder beneficiaries under PFJ involves enhancing the quality and accessibility of frontline agricultural extension services. To this end, program gains as of 2021 include expanding the dedicated extension officers pool from 1,586 to 4,286 professionals. This addition has substantially reduced the farmer-to-extension worker ratio across rural communities from 1:1900 to 1:1709 (Pauw, 2021). The greater coverage means more farmers have access to expert production advice and training. However, continued infrastructural limitations like unreliable internet connectivity hamper the breadth of digital-enabled advisory support provisions in remote areas.

2.6 PFJ program outcomes/ impacts

Program outcomes are the project's expected results (Watt, 2014; Porter, 2020). The PFJ program covers five pillars, namely, (i) provision of subsidized and improved seeds; (ii) subsidized fertilizer; (iii) agricultural extension services; (iv) establishment of markets; and (v) e-agriculture (MoFA, 2017). The Planting for Food and Jobs (PFJ) policy framework outlines that the fourth program pillar facilitates rural smallholder farmers' access to remunerative markets and value chains spanning local, regional, and global contexts (FAO, 2019).

The short-term 1-5-year expected outcomes involve establishing institutional linkages and opening market channels so subsistence farmers can sell surpluses beyond their village). This includes enabling access to regional trade networks, national commodity buyers, agro-processing centers, and export marketplaces (Abdulai et al., 2018). The mid-term 6-10-year outcome targets gradual improvements across dimensions like the affordability of transportation, breadth of buyer linkages established, the proportion of harvest sold, price realization ratios, and post-harvest loss reductions (MoFA, 2017). By this stage, robust field evidence regarding the strengths and weaknesses of existing market arrangements guides data-driven policy refinements. The long-term 10-15 vision entails structurally transforming small-scale agricultural production from semi-subsistence to full-fledged commercial orientation (MoFA, 2017). Here, farmers possess capabilities to respond to market signals, compete through cooperatives, and meet exacting buyer specifications while retaining sufficient bargaining power in negotiations.

2.7 Challenges of the PFJ program

Like any other development program, the PFJ has been confronted with some challenges that could potentially affect its implementation. Among these challenges are the

cumbersome and time-consuming registration procedures, which are requirements for subsidy access. PFAG (2019) indicated that this could discourage farmers from registering and thus participating in the PFJ program. Another key challenge was the inaccessibility to certified desired seeds of improved varieties by more than 50% of the farmers, mainly due to poor selection of varieties (PFAG, 2019).

The late arrival of inputs for the farming activities was another major challenge with the program. This was largely due to several challenges, including poor planning on the part of program managers as well as financial and procurement hurdles that confronted the administration at the regional and district levels (PFAG, 2019). The lack of inputs in certain areas, as well as the late arrival of inputs in some cases, was due to the fact that some of the elite in society used their political interference at the local level to hijack, divert, and smuggle fertilizers, hindering the aims and effectiveness of the programme (Pauw, 2021).

Poor storage and post-harvest management, which led to high post-harvest losses, was another major challenge with the PFJ program. This is largely because of market accessibility challenges such as poor road networks, which make it impossible for buyers to access the farms to buy the products on time. Also, there is a lack of warehouses to store and keep this farm produce in several areas. PFAG (2019), therefore, argued that poor market accessibility is reducing the viability of agriculture as a commercial profit-making venture capable of attracting the youth and consequently reducing unemployment (PFAG, 2019).

The lack of logistical resources for agricultural extension agents is another critical challenge of the PFJ program. According to the PFAG (2019), several extension officers need resources for GPS gadgets and motorbikes to reach more farmers in rural areas where the road network is terrible. However, the lack of these resources tends to hamper quality extension service, a key to the program's success.

2.8 Gender, societal structures, and NGO support in enhancing agri-productivity

Globally, women have been recognized for their immense contribution to agriculture. Studies by Patil and Babus (2018) and Giroud and Huaman (2019) provide evidence of this, especially highlighting the role of women in sub-Saharan Africa. Here, they account for between 60-80% of agricultural labour, making their participation central to food production and security (O Agada & Ajani, 2014; Palacios-Lopez et al., 2017). Yet, in spite of their substantial contributions, there exists a paradox: many of these women face disparities in access to vital resources. This predicament underscores the importance of integrating gender-responsive approaches in agricultural programs (Akalbila et al., 2020). One factor that has historically influenced access to resources, especially for women, is marriage. In many cultures, marriage can serve as a gateway to essential economic resources such as finance and land, which can significantly change the agricultural prospects for many women (Ogato et al., 2009).

Beyond societal constructs like marriage, another potent factor in agricultural advancement is education. Education, as indicated by studies like the one by O'Donoghue and Heanue (2014), can be a catalyst for the adoption of advanced agricultural techniques, resulting in improved yields. Moreover, an educated farmer is equipped with essential information and knowledge, which can significantly enhance their agricultural practices and decision-making abilities (Misaki et al., 2018).

In light of enduring productivity challenges in Ghana's agricultural sector, policy initiatives like the Planting for Food and Jobs (PFJ) program have recently been launched to catalyze grassroots transformation. By facilitating small-scale farmers' access to subsidized inputs including improved seeds and fertilizers, the program aims to raise yields, incomes and resilience for vulnerable rural households lacking resources (Agyemang et al., 2022). Early evidence indicates that PFJ participation correlates with increased productivity when implementation protocols are followed (Luther et al., 2018).

However, beyond direct government interventions, non-governmental organizations (NGOs) operating in remote areas also play a pivotal complementary role in uplifting smallholder welfare through agricultural extension services. As intermediaries bridging knowledge gaps, NGOs serve as conduits for disseminating technical expertise, agronomic training and scientific farm management practices to lift productivity (Ragasa et al., 2016). Many also facilitate linkages with financial institutions to help farmers secure credit for purchasing modern inputs, as well as support post-harvest aggregation, storage and marketing (Bingen et al., 2003).

Essentially, the interplay between grassroots NGO partnerships, gender-sensitive programming, improving rural education, and government schemes like PFJ together can transform semi-subsistence small farms into sustainable commercial entities. It is this coherent, collaborative effort spanning organizational scales and roles that promises a more inclusive, prosperous future for Ghana's agricultural sector, in line with national development goals. With farmers firmly at the center, ongoing empirically-grounded policy refinements responsive to their needs could catalyze positive change.

2.9 Determinants of small-Scale farmers' market access and marketing linkages

Various socio-economic and institutional determinants influence rural small-scale farmers' market access and linkages. Gender disparities in agriculture can significantly impact market access, with women often facing more barriers than their male counterparts (Peterman et al., 2014). Alongside gender, age plays a pivotal role in market access. Age was predicted to favorably impact output market access (Margaret et al., 2015). Younger farmers, in particular, might be more adaptive to market dynamics (Bezu & Barrett, 2012).

Education further amplifies adaptability, as higher education levels are often associated with the development of better market strategies and the establishment of broader networks (Bellemare & Barrett, 2011). The number of years a farmer has spent farming can equate to forming better market networks (Barrett et al., 2012), providing them with an advantage in accessing and linking to markets.

Economic factors, such as access to credit, play a significant role. According to Sheahan and Barrett (2017), access to credit allows farmers to invest in agricultural inputs like improved seeds, fertilizers, machinery, and irrigation systems, leading to enhanced market opportunities. Organizational affiliations further accentuate these opportunities. Affiliation with Farmer-Based Organizations (FBOs) often provides farmers with collective bargaining power, enhancing their market linkages (Narayanan & Gerber, 2013). This implies that being a member of an FBO could moderately affect transportation and logistics support, as well as the accessibility of processing centers. FBOs also play a vital role in disseminating timely and relevant market information to their members, as evidenced by Martey et al. (2014). Farmers may have established networks and communication channels through these organizations that enable them to collect and share information about market prices, demand trends, consumer preferences, and other market-related insights. Furthermore, diversifying income sources can provide additional stability. Farmers who engage in non-farming activities can attain economic stability influencing their market strategies (Barrett, Reardon, & Webb, 2001), enhancing their market participation and linkages.

2.10 Chapter summary

This chapter presents an overview of the PFJ program. It includes discussions on the program objectives with specific emphasis on the program's market linkages objectives, which is the study's trust. It also discussed the PFJ program inputs, which included

discussions on the implementation strategy focusing on the human, financial, and physical inputs and their role in ensuring effective program implementation. Furthermore, the program outputs and impact were also discussed in the concluding section of this chapter. The major outputs of the program are categorized broadly into interventions and the PFJ audience. The key interventions include training, advisory services, trade expos, and information materials. In contrast, the major audience is the small-scale farmers, who are pivotal in the entire implementation of the program. In the long term, the project is expected to increase the productivity, income, and welfare of small-scale farmers who are direct beneficiaries.

CHAPTER 3: SMALL-SCALE FARMING BUSINESS IN RURAL GHANA

3.1 Introduction

The previous chapter provided a general overview of the Planting for Food and Jobs (PFJ) program. Some of the key emphasis of the chapter included the objectives of the PFJ program with much emphasis on the market access/market linkage objective of the PFJ. It also reviewed the literature on the inputs, output, and outcomes/impacts of the PFJ program.

The overview of small-scale farming businesses in rural Ghana forms the main emphasis of this chapter. The chapter begins with an overview of agriculture in Ghana and reviews the status of small-scale farming businesses in rural Ghana. The chapter also captures the socio-economic contribution of small-scale rural farms in Ghana as well as the economic sustainability of small-scale farming businesses in rural Ghana. The chapter concludes with a summary.

3.2 Overview of agriculture in Ghana

Agriculture is the African economy's single most imperative sector. It contributes significantly to poverty reduction (MoFA, 2016], thereby assisting in the achievement of the first and second pillars of the United Nations Sustainable Development Goals (SDGs) (Ali et al., 2021). Despite the Millennium Development Goals (MDGs) of cutting poverty and malnutrition in half by the end of 2015 (Ansah et al., 2020; Food and Agriculture Organization (FAO), 2020), a significant proportion of the Ghanaian population still lives below the poverty line of USD 1.25 per day (Ministry of Food and Agriculture, (MoFA), 2017]). To a large extent, this is due to low agricultural productivity, as smallholders account for the vast majority of farmers in Ghana. An estimated 30 million people make

up the population of Ghana; thus, enhancing agricultural output and providing jobs in agriculture's value chain has become imperative (MoFA, 2017).

Ghana's agriculture undoubtedly contributes to providing food, sources of raw materials for industries, employment creation, and foreign aid (Ali et al., 2021). The agriculture sector continues to be crucial to numerous aspects of the economy of Ghana. For instance, the sector hires around 50% of the Ghanaian population. It accounts for a significant growth rate of 18% in Gross Domestic Product (GDP) in 2019 (GSS, 2019; GIDA, 201) and currently stands at 19.7% (ISSER, 2020). Its contribution as a source of foreign exchange earnings cannot be overemphasized, which Governments in West Africa use in financing developmental projects in their countries (Owusu & Frimpong, 2014). Approximately 40% of export income is generated from agriculture, which provides around 90% of the country's food needs (ISSER, 2020).

There are 77 people per square mile in Ghana's average population density of 2.2% (GSS, 2017; World Bank, 2018). Approximately 68% of the population lives in rural areas and 32% in urban areas among the 16 administrative regions and agricultural zones. Ghana has a workforce of 52 % engaged in agriculture, compared to 29% in services and 19% in industry. Women comprise around one-third of the rural agriculture labour force (FAO, 2020; ISSER, 2020).

Despite its significance, Ghana's agriculture is still primarily smallholder, traditional, and rain-fed (MoFA, 2017). According to the Ghana Irrigation Development Authority (GIDA), 2018, the country's agricultural land is anticipated to be 14 million acres. However, only around 50 percent is currently under cultivation, and 222,978 acres are under irrigation out of an estimated 6 million acres cultivated. An estimated 57% of Ghana's total land area, or 136,000 square kilometers, is classified as agricultural land. Most farmers (60%) had farms with less than 1.2 ha of land, while around 25% had farms with 1.2 to 2.0 ha of land, and just about 15% had farms with more than 2.0 ha of land, according to the

(USDA, 2001). Agricultural land in the country is dominated by small and medium-sized farms up to 10.0 hectares, with an average farm size of less than 1.6 ha (MoFA, 2018; GIDA, 2018). In 2018, the agricultural value in Ghana gave a net output of 12.0 billion USD (ISSER, 2020; GSS, 2019). Though the growth was less in 2019 target of 6.0% and the projected growth rate of 5% in Agenda for Jobs (World Bank, 2018), Ghana's agricultural value was US\$11.0 billion and was a result of the sector push from a diversity of commodities, a well-endowed drainage basin, a well-established agricultural research system, and relative proximity to the European market (MoFA, 2017). Comparatively, the sector continues to impact significantly the decrease of poverty.

Ghana's agriculture sector is divided into four sectors: crops, livestock, forestry and logging, and fisheries, all contributing to the country's economy. The farming systems diverge with agroecological zones in Ghana (GSS, 2019; MoFA, 2020). Despite this, there are several commonalities across the country. For instance, the bush fallow method prevails when there is enough acreage to allow a plot to be rejuvenated to regain its fertility after one to three years of agriculture. Generally, while cash crops are typically grown as a single crop, staple crops are frequently mixed-cropped. Ghana has six crop categories: Industrial crops, starchy tuber and root crops, cereals, legumes, fruits, and vegetables. Cocoa yam, cassava, sorghum, maize, groundnuts, rice, oil palm, tomatoes, pepper, pineapple, oranges, and onions are some of Ghana's most important agricultural products.

Cocoa, oil palm, coffee, and rubber are tree crops that grow in Ghana's forest zone. Plantain, cocoyam, and cassava are commonly intercropped with other food crops in the forest zone (Boakye-Achampong et al., 2017). Maize, beans, cocoyam, yam, tobacco, and cotton are the principal cash crops in the middle belt. Cotton, tobacco, sorghum, maize, millet, cowpeas, groundnuts, and yam are well-known food crops in the northern caucus, although rice can be grown in any of the region's agroecological zones (Boakye-Achampong et al., 2017). Consequently, the contribution of agricultural subsectors to

GDP indicates that crops except cocoa accounted for the highest GDP, representing 65%. While cocoa, forestry, and logging subsectors of agriculture contribute 10% each, livestock and fisheries represented 9% and 6%, respectively in 2020 (ISSER, 2020). Ghana's cocoa production in the global market is rated as the second largest producer, accounting for 30% of foreign earnings to the entire GDP (Attipoe et al., 2018). The Ghana Cocoa Board (COCOBOD) articulates all cocoa activities concerning the buying price and marketing of cocoa beans in the world market. Cocoa production has spread across Ghana's regions, notably in the Western North, Ahafo, Bono, Bono East Ashanti, Eastern, Western, and Volta areas. As many as 700,000 households in Ghana cultivate cocoa in small plots of less than 2.5 hectares, which is the key to the country's cocoa production success (Asante-Poku & Angelucci, 2013). Ghana's cocoa yields, on the other hand, are significantly lower than those of other major cocoa-producing countries. For instance, while the average cocoa output in Ivory Coast and Indonesia was 600 and 1000 kilograms per hectare, that of Ghana was around 400 kilograms per hectare (Streck et al., 2017). However, production figures show that yield has recently increased substantially in virtually all the municipalities across Ghana (Adjinah & Opoku, 2010). Research has indicated that cocoa growers can produce up to 1000 kilograms of cocoa per hectare (Aneani et al., 2011).

Oil palm is the most important edible oil crop in West Africa, particularly in Ghana. Two percent (2 %) of Ghana's total agricultural production value is derived from oil palm and palm kernel oil (OKOO) (ISSER, 2020). The export of oil palm from Ghana was approximately USD 71.4 million at the end of 2018. (ISSER, 2020). Oil palm cultivation thrives in the Western, Central, and Eastern regions. In 2010, according to the World Bank, one-third of the world's vegetable oil consumption and nearly 60% of international trade were accounted for by oil palm (FAO, 2015). Because of its wide range of applications in both the food and non-food industries, it has several advantages over other oils (Shimizu & Desrochers, 2012). The area under oil palm production in Ghana has increased from 289,170 hectares in 2003 to 360,000 hectares in 2016 due to recent

growth in the palm oil sector (MoFA, 2015). Many rural communities of Ghana, where oil palm plants abound, have seen an increase in women turning palm fruits into edible oil due to the boom in oil palm farms. Crude palm oil production (CPO) in Ghana from 2002 to 2010 demonstrates that small-scale palm oil processing is dominated by women, who tend to produce the highest amounts. According to Ministry of food and agriculture (MOFA) (2011), the total amount of crude palm oil produced in 2010 was 402,473.00 metric tonnes, with 80% coming from small and private farms. Thus, the Government highlighted palm oil production as a viable source of employment and economic growth in rural areas.

Over the past years, cashew production has contributed to the development of the economy. The major regions of cashew production are Bono, Ahafo, and Bono East, contributing almost 90% of cashew exports (Boafo & Yeboah, 2022). Currently, Ghana panels 44% of shell cashew exports in the world (Deepika, 20021). The country produced approximately 70,000 metric tons, generating USD 981 million in 2016 (ISSER, 2020). According to the Ghana Export Promotion Authority (GEPA) (2018), cashew exports contributed around 17.8 million in cashew kernels in 2017 and US\$211.3 million in 2015. Again, about 53% of the total exports from non-traditional crops in 2016 and US\$ 280 million in 2018 were tree crop export earnings (GEPA, 2018). The key goal was to further expand cashew development into a more stable and sustainable source of foreign exchange and an avenue for job creation and poverty reduction. Cashew production is a smallholder business with an average farm size of 0.8 to 2.5 hectares in Ghana. The farmers depend on traditional agricultural methods for cashew production; however, they produce almost 60% of the cashew kennels in the country (World Bank, 2018).

Such farmers are among the poorest in Ghana, according to Aryeetey and Mackay (2004). As a result, efforts to increase cashew production and productivity could significantly impact poverty reduction and food security for a significant portion of the population in the country (World Bank Report, 2018). Regarding Ghana's rubber sector,

Para rubber production covers 12,000 hectares of land (ISSER, 2020). Of the 7,000 village plantations and 3,600 recently established plantations, annual output trends are 12,000 tonnes (GREL, 2022). In Africa, Ghana is the fifth-largest producer of rubber (FAO, 2022). Ghana Rubber Estate Limited (GREL) controls the most significant industrial rubber plantation in the country and oversees the domestic rubber market, which accounts for about 98 percent of its output. Last but not least, the corporation has secured a 36-year concession covering 15,000 hectares, of which 9,034 hectares are currently being tapped, totaling +13,377 hectares under cultivation (GREL, 2022).

The Government of Ghana, realizing the potential of rubber cultivation decided to assist small scale rural farmers to establish plantations (Delarue, 2009). Under phase one to phase five of the project, 7800 farmers were assisted in planting over 26000 hectares (Ruf & Schroth, 2015; Paglietti & Sabrie, 2013). This initiative has provided bulk employment for the people of selected districts in the Western Region, Central, and Ashanti Regions of Ghana (Sekondi-Takoradi Chamber of Commerce and Industry) (Paglietti & Sabrie, 2013).

One of Ghana's primary sources of food security and a significant contributor to agricultural GDP for decades has been cassava (ISSER, 2020). While it is easy to grow, the starchy crop has a low nutritional value. Cassava's status as a food security crop has risen due to its rising use in the brewing industry. The amount of cassava in the root crops sub-sector averaged roughly 54% between 2000 and 2005, compared to other root crops (yam, cocoyam, and plantain) (ISSER, 2006). In the same period, yams contributed an average of 22%, cocoyams 10%, and plantains 14% of the total (ISSER, 2006). While the Upper East and Upper West areas lack cassava cultivation due to the local vegetation, cassava is widely grown in the other regions, namely Eastern, Bono, Bono East (including Ahafo and Ashanti), Ahafo and Ashanti Central (including Central and Volta). Because of this, Ghana is West Africa's second-largest yam grower, producing an estimated 8 million tonnes per year. This country's most productive regions include Northern Ghana, Brong

Ahafo, Upper West, Eastern, and Ashanti. More than \$48 million has been collected from yam exports in Ghana since 2016 (GEPA, 2022). Cassava, yam, and plantain are the world's three most important food crops (FAO, 2006). Plantain accounts for 13.1% of agricultural GDP and has a per capita yearly consumption of 101.8 kg (FAO, 2006). Only 0.5 tonnes of the country's annual plantain production are exported at USD 30 million (bananas inclusive) (FAO, 2006). Ghana is the highest-ranked country in West Africa and the third-highest in the entire continent. There is great potential for smallholder farmers and the country as a whole to benefit from the plantain.

Cereal crops in Ghana are mostly consumed worldwide and provide more than half of calories twice what is obtained from cassava (Amponsah *et al.*, 2021; Ali *et al.*, 2021). The total output of major staples in 2019 was 42.6 million metric tons, as against 39.3 million metric tons in 2018 (MoFA, 2017). The increase in output resulted from the general yield increases of the various staples. Despite the numerous economic importance of cereals, such as their massive contribution to poverty reduction and food insecurity, domestic supply lags behind local consumption due to the limited levels of production and the effects of post-harvest losses (Rutten & Verma, 2014). In Ghana, maize is the country's most important cereal crop. It is one of the largest agricultural commodities in production volume and accounts for 3.3% of overall agricultural production volume (Our World in Data, 2021). There was a 55% increase in the production of maize grain compared to paddy rice, sorghum (23%), and millet (9%), according to MoFA (2019). Poultry feed and brewing require maize, as does the food sector. It is grown using traditional methods and is usually rain-fed, resulting in an on-farm average yield of 1.92 metric tonnes per hectare in 2015, whereas the potential output was 5.5 metric tonnes per hectare (MoFA, 2019; ISSER, 2020). Although grown in the whole of Ghana, the majority of Ghana's maize is grown in the middle- -southern half of the country, with the Bono, Ahafo, Eastern, and Ashanti regions accounting for 84% of the country's total production.

Rice, on the other hand, is ranked second in importance to maize in Ghana (MOFA, 2015). 60 % of Ghana's cereal imports between 2005 and 2016 were rice imports, according to MoFA (2015). Thailand and Vietnam are the top exporters of rice to Ghana at the moment. Rice production in Ghana is undertaken in three different ecologies – low land rain-fed ecology (78% production), upland rain-fed ecology (6 percent production), and irrigated ecology (16% percent production) (Owusu et al 2013). Rain-fed rice production accounts for 84 %, resulting in average paddy yields of 1.0 to 2.7 metric tonnes per hectare (Israel's Trade and Economic Mission to Ghana, ITEMG 2020). While irrigated production accounted for the highest average of 4.5 metric tonnes per hectare, the potential yield was six metric tonnes per hectare in 2015 (ITEMG, 2020)

Ghana's Northern Regions, including Bono and Ahafo, and the Volta Region, are major producers of the grain crop sorghum. The northern regions produce almost 97% of the country's output. Sorghum is mainly grown by small farmers whose average land holdings are less than 2 hectares. Sorghum is Ghana's third-largest cereal crop, after maize and rice, accounting for 13% of the country's total cereal production. For rain-fed sorghum, the average output in 2015 was 1.10 tonnes per hectare, with a potential yield of 2 tonnes per hectare anticipated (MoFA, 2017).

In relation to legume crops, soybeans are a relatively new addition to Ghana's smallholder farmers' rotations with maize. Typically, smallholders cultivate crops using traditional production farming procedures and rain-fed circumstances, which are the most common methods used (MoFA, 2017). ISSER (2020) states that soybean production in West Africa was anticipated at 142,000 metric tonnes in 2015. The favorable production area is the northern part of Ghana; however, achieving the aim of 3 metric tonnes per hectare of rain-fed crops per acre is still a long way off, and post-harvest losses are also substantial in northern Ghana (ITEMG 2020)

Ghana and other nations in Sub-Saharan Africa rely heavily on groundnut as a legume crop. Nuts can be eaten raw or roasted and used to make edible oil, which is then consumed. 94% of Ghana's output comes from the country's northern regions (MoFA, 2017). Mostly, metropolitan regions in the South use the traditional marketing system to promote their residents and businesses.

Regarding fruits such as pineapples and mango, pineapple production in Ghana accounted for the leading horticulture export product. For instance, in 2004, shipments from Ghana amounted to 10% of the total market share (MoFA, 2013). As a result, the rise of MD2 variety on the export market and the shift in customer preference from smooth cayenne to MD2 posed significant problems to the industry. Agronomic methods for the MD2 cayenne are more stringent than those for the smooth cayenne type. As a result of these losses, overall pineapple export revenue fell from USD25 million to USD17 million between 2012 and 2014. (GEPA, 2020). In 2015, Ghana exported pineapples for a total of \$20,539,000. (ISSER, 2020). As for mango production, Ghana is believed to have 10,000 acres under mango agriculture that produce 15,000 metric tonnes and exports less than 40%. Ghana became a major importer of mangoes to nations including the United Kingdom, the Netherlands, and Germany in 2016, exporting over 4,700 tonnes of mangoes (GEPA, 2020).

A growing middle class is putting pressure on farmers to provide more and better-quality fresh fruit. This leads to an increase in the domestic vegetable market of roughly 10% per year (World Bank, 2011). . Tomatoes, sweet and hot peppers, and onions are the most popular veggies in the area. Furthermore, the vegetable industry in Ghana has a great deal of export potential. Vegetable exports have a potential market worth of \$50 million. In contrast, the present export value of vegetables is only USD 8 million, as farmers cannot meet international food safety norms (MoFA, 2017).

Nearly a quarter of Africa's total agricultural value is derived from the production of cattle (MoFA, 2017). Meat consumption is expected to rise dramatically in the future years. About 7% of the country's agricultural GDP comes from the cattle industry, which significantly contributes to the country's agricultural growth. Ghana's population consumes livestock products at a rate of 6.7%. (ISSER, 2020). Ruminants (such as cattle, sheep, and goats) and pigs are the most common types of livestock. In addition to the more common poultry and non-traditional animals like guinea fowl, ducks, turkeys, and ostriches (to name just a few), there are many exotic species to consider. The chicken sector currently only meets a small portion of the country's demand, so imported poultry is more affordable. Only a few large-scale poultry operations in Ghana are dedicated to producing eggs rather than broilers.

Most rural households generally raise animals of some form; poultry is most common in the southern half of the country, while cattle are primarily raised in the Savannah region. Most of the country is devoted to raising sheep and goats (MoFA, 2015). As an important part of farming communities' sociocultural fabric, ruminant cattle provide both an economic and a symbolic lifeline in times of need. For various reasons, sheep and goats are sometimes slaughtered for births, funerals, and marriages (MoFA, 2015). In 2000, 66,283 metric tonnes of livestock meat were produced in Ghana, with 27% beef, 18% mutton, 17 % goat meat and pig meat, and 21% chicken meat contributing to the total (MoFA, 2017).

In order to meet its animal protein needs, Ghana imports animals, meat, and milk. However, it is difficult to quantify the number of cattle and meat imported from Burkina Faso, Mali, and Niger, as most of the live imports from the northern neighbors are not documented. In 1998, Tema's main port received a total of 22,727 metric tonnes of livestock goods, including 10,143.5 metric tonnes of chicken, 1,724.0 metric tonnes of cattle, 757 metric tonnes of pork, 9,941.1 metric tonnes of dairy, and 362.7 other items (LPIU, 1999).

Ghana's fishing sector includes the marine, inland (freshwater), aquaculture fisheries, and related industries like storage, preservation, marketing, and distribution of fish. Fisheries are essential to the national economy and contribute significantly to the country's growth. 3% of GDP and 5 % of agricultural GDP are attributed to the sector (Ministry of Fisheries and Aquaculture Development, MOFAD, 2016). Around ten percent of the country's population is employed by the fishing sector in some capacity. Marine fisheries comprise over 80% of Ghana's seafood consumption (ISSER, 2020). Many current supply and consumption patterns can be attributed to freshwater fisheries, particularly aquaculture. Artisanal, Semi-Industrial (inshore sector), Industrial (deep sea), and Tuna fleet activities in Ghana's marine fishing industry all describe the industry structure. Although aquaculture has only recently been implemented to address Ghana's fish needs shortage, it has already proven an effective solution. The aquaculture sub-sector is dominated by small-scale subsistence farmers who perform extensive aquaculture in earthen ponds in contrast to the intense practices of commercial farmers.

There has been a rise in smallholder food crop output in recent years, but productivity remains low due to various issues, including weak extension services and aged farmers (World Bank, 2018; ISSER, 2020). Rice, wheat, sugar, and chicken are among the many agricultural items that Ghana imports in large quantities. Moving forward, the Planting for Food and Jobs (PFJ) is a government initiative program that provides farmers with seed, fertilizer, and know-how in primary commodities and cash crops and encourages natural soil maintenance and technologically advanced growth methods. The program also encourages investment partnerships to address innovation and value-added production, focusing on domestic, African regional, and export-led growth.

3.3 The status of small-scale farming business in rural Ghana

The context of small-scale farming is relative, and the framework within which it is conceptualized determines the kind of urgency that will be assigned to it. For instance, in the Nigerian context, small-scale farming constitutes farm production whose activities fall within 0.1 to 4.99 ha of land holdings (Mgbenka, Mbah & Ezeano, 2016). In the South African context, small-scale is seen as engagement in traditional or subsistence farming on small plots of land associated with low turnover and limited resource endowments (Davidova, 2011). However, in the Ghanaian context, it has been revealed from the above that about 85% of all farms within the country are operated between 1.2 to 2.0 hectares of farm size, with just about 15% going beyond 2 hectares (World Bank, 2018; ISSER, 2020). Thus, according to Chamberlin (2007), small-scale farming is the farming category carried on 2 hectares of land size or less.

Although small-scale farming in rural Ghana contributes significantly to the country's economy, it has been deemed insufficient to fulfill the national and global move toward increasing both quantity and quality. Global food demand is expected to rise by 70% by 2020 due to rising global population (from a projected 6.9 billion to 9.3 billion people), economic development, and altering consumer preferences (FAO, 2020). This poses enormous problems for agriculture around the world. With such a rise in demand for food already overwhelming in terms of sheer numbers, the effects of this growth must be taken into account at greater length. Seven out of ten people will live in food-deficient countries in the next three decades, providing both challenges and opportunities (Oxfam, 2011). The cost of food has been a critical source of political and social upheaval, most recently in 2008 and 2010, when prices rose sharply.

There will be new challenges and opportunities for those living in low-income, food-deficient nations by the year 2050 (Oxfam, 2011). There is a strong correlation between rising food prices (2008 and 2010) and political and social unrest (as seen by the 2008

and 2010 food price spikes). The use of food crops for biofuels, changing water and land use restrictions, and the unpredictable effects of weather, in combination with the longer-term effects of climate change, will all contribute in different ways to increased variability in food production and regional food supply imbalances (Oxfam, 2011).

As a result, small-scale farming, which forms the majority of all farm holdings in the country, should be seen as a business with the intention of being given attention as would in any mission-led private organization. However, rural small-scale farming continues to face serious setbacks partly due to the inability to increase farm size, limited vital market information, poor road network, storage and marketing facilities, limited access to modern agricultural technology, and climate, which has become a global concern (Abraham & Pingali, 2020). Subsequently, smallholder farmers fail to attain higher yields, resulting in low incomes (Bouare, 2018; Mojo et al., 2017).

Also, the small-scale rural farming in Ghana is characterized by the aged whose knowledge in farming is hung on experience, thus being incapable of meeting current demands (MOFA, 2015). Their physical strength also permits them to give nothing short of their best. As a result, national campaigns want to promote youth engagement in the farming business, such as Planting for Food and Jobs (PFJ) and the National Entrepreneurship and Innovation Program (NEIP) under the Ghana Cares Obaatanpa Program. As a result, these initiatives are designed to encourage youth to get involved in farming because they make up about one-fifth of the entire population. In addition, the number of rural youngsters is expected to keep rising, particularly in sub-Saharan Africa. This demographic shift exacerbates the difficulties facing the labour market and the quest for decent work and livelihoods for today's and tomorrow's youth (Proctor & Lucchesi, 2012).

There has been discussion about the need to challenge the prevalent assumptions regarding small-scale farming especially true in Western countries where large-scale

farming is the norm (Proctor & Lucchesi, 2012). However, there is shifting attention toward supporting small-scale farms (World Bank, 2018).

Technological progress drives the agricultural sector, increasing productivity and promoting agricultural development. Mechanization allows small-scale farmers to cultivate multiple crops, increasing cropping intensity (Diao et al., 2014; MoFA, 2017; Agribusiness Indicator, 2020). Ghana's small-scale farming system, which is based on outdated traditional methods is not sustainable. Small-scale farmers in Ghana continue to practice the "cutlasses and hoes" method with no irrigation and post-harvest processing. Numerous small-scale farmers in rural settings have little or no access to agricultural machinery (Agribusiness Indicator, 2020). It is therefore not surprising that rural small-scale farmers have low productivity and low profits from their farming activities. Against this backdrop, the Ghanaian government introduced the Agriculture Mechanization Services Enterprise Centers (AMSEC) concept (MoFA, 2015). However the strategy did not succeed (Ali et al., 2021).

Creating a solid link between markets, research, and policies is critical to the growth of small-scale farming businesses in rural Ghana. Thus, linking agricultural research to market studies to inform better policy formation is critical to Ghana's agricultural sector's long-term development (FAO, 2015; MoFA, 2017; World Bank, 2018). However, such expectations appeared bleak in Ghana's rural farming industry. For example, access to a reliable market for smallholder farmers is critical to developing the agricultural sector and achieving economic food security status. Farmers, on the other hand, face several challenges as a result of the gap between research, markets, and policy, such as over-exploitation by middlemen, poor road networks, and so on (Yankson, Owusu, & Frimpong, 2016). This has led to inefficiencies and discouraged smallholder farmers from continuing to produce.

Previous studies have opined that one of the main challenges for small-scale farming businesses in Ghana is a lack of ready markets because of a lack of processing facilities (Ansah, Ehwi, & Donkoh, 2018; Ali, Agyekum, & Adadi, 2021). Smallholder farmers' lack of bargaining power is also a major challenge for farmers, especially in developing countries like Ghana. This is because most of these farmers lack information on prices, alternative marketing strategies, and demand conditions. Some farmers may also breach agreements, putting traders at a disadvantage. According to reports, these contractual deficiencies reduce market system performance (Poole, Seini, & Heh, 2003). In Ghana, smallholders are rarely directly involved in the marketing chain of their products for export trade. These farmers typically form relationships with export agents. As a result, the gains of smallholder farmers in Ghana are determined by market structure (Sarpong, 2021; Ali, Agyekum, & Adadi, 2021).

3.4 The socio-economic contribution of small-scale rural farms in Ghana

Small-scale farms and related rural areas are home and workplaces for about half of the world's population. The vast majority of the world's 570 million farms are small-scale farms operating on land sizes up to 2 hectares, accounting for around 475-500 million of these (IFAD, 2013; Wiggins, Kirsten, & Lambi, 2010; Lowder, Scoet, & Raney, 2016), particularly in developing countries. Ghana's agriculture is dominated by smallholder farmers (80 percent), traditional farming methods, and rainwater harvesting (ISSER, 2020). In this regard, the importance of these households in developing rural areas and the overall economy cannot be overstated. While the decline of small farms in the second half of the twentieth century was viewed as a natural process due to their inability to compete with efficient agribusiness, this perception has shifted in recent years, and small family farms are gaining ground in the twenty-first century (Shucksmith, & Rønningen, 2011; Lowder, Scoet, & Raney, 2016; Janvry, & Sadoulet, 2010).

According to GSS (2014), there are differences in landholding size distribution by ecological zone among small-scale farms. The savanna zone, with a mean landholding of 4.0 hectares, has larger holdings than coastal and forest zones, with means of 2.3 and 3.1 hectares, respectively. Regarding landholding distribution, around 70% of farmers own the average or less landholding, whether at the national or ecological level. Most agricultural households in the forest and coastal zones have two or below 2 hectares, constituting 52% and 67%, respectively, whereas close to 45 percent of savanna households have two or below two hectares (GSS, 2014; Chapoto et al., 2018). Simultaneously, the area under cultivation has increased significantly, with the total land area harvested more than doubling—from 2.4 million 7 hectares in 1990 to around 5 million hectares in 2011 (FAO, 2013; Ghana Statistical Service 2012; World Bank 2012). Small-scale rural farms in Ghana contribute significantly to the reduction of the unemployment rate in the country. About two-thirds of Ghana's population lives in rural areas where agriculture is the main occupation (Edusah & Antoa, 2014). This presents huge opportunities for them. However, the major production challenges, the major one being over-reliance on the natural weather for farming activities, often serve as disincentives for most rural dwellers, especially the youth, to embrace farming.

Also, small-scale farming serves as an avenue for income generation for various chain players, enabling them to access life's basic needs. On average, a small-scale farmer can potentially earn about 2,200 Ghana cedis for an acre of a farm (ISSER, 2020). It has been revealed by scholars that most of the world's poor live in rural areas – rural poverty which is acute in sub-Saharan Africa and South Asia (Edusah & Antoa, 2014; Chapoto et al., 2018; Lowder, Scoet, & Raney, 2016; World Bank, 2018). Farmers who are landless and even those with farms but produce on subsistent scale struggle to fulfill their basic needs. However, small-scale farmers who work on their own land can undertake multiple jobs off-farm and earn a diversified income to meet their economic and social needs. That notwithstanding, their export from what they produce also contribute to the national net revenue of the country.

Small-scale farmers are projected to play a vital part in the food security equation as the world's population grows and becomes wealthier and urbanised in the coming decades (Fan & Rue, 2020). Even though these farms make up only 12% of the world's agriculture, they produce an estimated four-fifths of the food in Asia and sub-Saharan Africa (Lowder, Skoet, Singh, 2014). The result is that 821 million people worldwide are starving (UNICEF 2018; Rivera et al., 2020). As a result, the second Sustainable Development Goal builds on earlier hunger-eradication initiatives and offers an ambitious objective of ending world hunger by 2030 (Godoy-Duran et al., 2017). SDG 2's key targets are to eliminate all kinds of malnutrition by 2030, protect sustainable food production systems and implement robust agricultural practices, double smallholder farmers' production and profitability by 2030, and conserve the genetic variety of plants, seeds, and animals by 2030. The following set of actions will help achieve these objectives: the adoption of measures to ensure the efficient functioning of food commodity markets and the facilitation of timely access to market information; the rectification and prevention of trade restrictions and distortions in agricultural markets around the world; and an increase in investment through improved transnational cooperation (Rivera et al., 2020). As a result, Ghana has developed several agricultural policies, including PFJs, RFJs, Planting for Export and Rural Development, Greenhouse Villages, and AMSEC. It is hoped that these initiatives will assist Ghana's agricultural sector to recover from its recent decline in growth. These governmental incentives will encourage investment in the country's agriculture industry. In other words, smallholder farmers have a critical job in ensuring that people have ready access to safe, nutrient-dense food to sustain a healthy, active lifestyle now and into the future.

Despite its enormous agricultural potential, Ghana has recently been a net importer of agricultural products. More and more food is being imported from the United States. Agricultural imports 2018 amounted to \$2.52 billion in US dollars for Ghana (Statista, 2020; ISSER, 2020). Darfour and Rosentrater (2016) estimated that Ghana imports between 70 percent and 15 percent of its overall consumption of rice and maize. The

country's food insecurity has been greatly decreased, but local crop output has been adversely affected. As with other industries, Ghanaian farmers cannot compete with imported goods because of their lower prices. Ghana's high domestic agriculture production costs compared to cheaper imported alternatives is a key factor explaining the nation's rising food import expenditure. However, despite trade competitiveness challenges, the small-scale farming sector has provided livelihoods for almost 800,000 rural households, highlighting its immense socioeconomic importance (Bunn et al., 2019; Asamoah & Owusu-Ansah, 2017). These smallholder enterprises not only drive local job creation but also food security through supplying major staples for consumption. Therefore, safeguarding the viability and growth potential of small-scale agriculture is pivotal for Ghana given its massive rural labor absorption capacity.

3.5 Economic sustainability of small-scale farming business in rural Ghana

Considering the important socioeconomic contributions made by small-scale farming at both the unit, national, and international levels, proper initiatives to ensure the economic sustainability of this farming category in rural Ghana are imperative. This necessitates tailored approaches accounting for the sheer numbers of small-scale farmers, their heterogeneity across dimensions like assets and capacities, as well as evolving rural population dynamics. Small-scale farming business in Ghana has steadily grown and attracted the interest of numerous government and other stakeholders – researchers, donors, and non-governmental organizations, seemingly to meet employment challenges, arouse innovation and development to achieve sustainable development (World Bank, 2010; Musamali & Tarus, 2013; Anang et al., 2020; Danso-Abbeam et al., 2018). As a result, both developed and developing countries are actively involved in and will continue to seek pragmatic ways to improve the activities of small-scale farms.

Small-scale farming in rural Ghana continues to significantly contribute to economic development, particularly in job creation, income generation, and intermediate technology diffusion. According to Daniels (2004), small-scale farms have been identified as the engines that can help developing countries achieve their growth objectives, as it is estimated that job creation and income growth. According to previous studies, small-scale businesses in developing countries create opportunities for income generation and distribution, capital accumulation, poverty reduction, and empowerment of people, particularly women, confirming the importance of small-scale farms in economic development (World Bank, 2010; Babajide, 2012; Abbeam et al., 2018; Anang et al., 2020). Meijerink and Roza (2007) opined that small-scale farms could thrive in rural areas due to the availability of land, low-cost farm infrastructure and technology requirements, and few small markets. Experiences in rural communities show that small-scale farms can help increase household income, diversify household income sources, and reduce household poverty and vulnerability (Davis et al., 2009; World Bank, 2010; Babajide, 2012).

Despite the potential of small-scale farming businesses to facilitate and foster economic growth in rural settings, several studies have identified a major barrier impeding small-scale farms' role in achieving economic sustainability (Lawson, 2007; Meijerink & Roza, 2007). Low yields of staple and cash crops are the small-scale farms' primary challenge. According to the World Development Indicators (WDI) (2016), while the expected yield for cereals is over 5.0 tons per hectare, the estimated regional yield is 2.0 tons per hectare. Several other issues have exacerbated the situation, including low soil fertility and pest and disease incidence, insufficient extension services and financial support, low use of improved agricultural technologies, unpredictable climate conditions, and unsustainable agricultural production practices (Mogomotsi, Sekelemani, & Mogomotsi, 2020; Ali et al., 2018; Dube et al., 2016). Small-scale farmers' access to financial help is based on three essential dimensions: physical access, affordability, and relevant features that fit their needs. Many of Ghana's rural small farms will start small and eventually go

out of business because they lack the financial resources and infrastructure to grow in terms of output and profit. Because the small-scale inability to mobilize and collect resources for productive use strongly depends on the availability and accessibility of credit (Musamali & Tarus, 2013; World Bank, 2018).

The scope of rural economies covers all economic activity, infrastructure, and natural resources imperative for development (Davis et al., 2009). Given this broad definition, there should be a push to promote non-farm-based activities in rural areas to facilitate economic development. For example, encouraging manufacturing (especially agro-processing), small business startups, and a switch from cash crop cultivation to commodity trading during off-seasons could generate income without complete reliance on agriculture. Additionally, long-term economic progress would benefit from policies that prompt rural households and individuals to pursue diverse income sources that enhance financial stability. Diversification provides resilience against shocks to any one sector (He, Miao & Qureshi, 2022). By encouraging rural communities to undertake manufacturing, small business ventures, strategic commodity trading in addition to cash crop agriculture, and by incentivizing households to access multiple income streams, economic development policy can promote the well-being and prosperity of rural areas.

Many scholars have promoted the idea of mechanizing small-scale farming to an appreciable necessary enough to increase productivity, thus, ensuring that maximum potential is realized (Clarke, 2000; Obi, 2011; Mehta et al., 2014; Anang, 2018; Diao et al., 2018). Others have also focused on supporting small-scale rural farmers with substantial financial credit facilities to increase production capacities by affording necessary inputs for their farming activities (Nkegbe, 2018; Abdallah, 2016; Anang et al., 2016). That notwithstanding, others have also recommended intensification of extension services (Anang et al., 2020; Danso-Abbeam et al., 2018; Wossen et al., 2017; Ghimire et al., 2015), access to irrigation (Anang et al., 2017), access to subsidies (Jayne et al., 2013; Dorward & Chirwa, 2011).

The assumption that adopting broad-based "one-size-fits-all" interventions will secure an adequate livelihood for most small-scale farmers, like any business, may be mistaken. Significant decisions must be made for specific groups of small-scale farmers to allow for rural transformation in the coming decades while also reducing risk to food security and livelihoods. Such decisions must take into account trade-offs and potential adverse outcomes. Also necessary is a well-informed public discussion about the various development avenues available within a particular nation.

Income diversification strategies have guaranteed sufficient income for cocoa farmers throughout the year since current studies still highlight inadequate income as one of the most crucial challenges confronting smallholder farmers in Ghana (Danso-Abbeam et al., 2020). Others are also of the view that some farmers, though diversifying their sources of income, still depend on financial credits for survival during some of the years either because their already available diversification strategies did not offer them enough income or because the activities involved in the so-called diversification strategies are too harsh for them to cope with (Anang & Apedo, 2023). Therefore, it is obvious that a more realistic and sufficient strategy is needed to end the income challenges the cocoa farmers face in the country. Alternative perspectives on small-scale farming are needed. These perspectives must provide livable livelihoods that society values, contribute to national and global food security, and help manage the world's natural resource base. Understanding the diversity of small-scale farming and its evolution within rural and intergenerational development contexts must be part of this. Consequently, choices for small-scale farming also include the following techniques:

- The small-scale farmer should increase his scale and productivity, develop a business mindset, and connect to safe and dynamic value chains in order to earn a respectable living for the household;
- Small-scale farming should become a part-time endeavour or one of many ways for the household to generate additional income;

- A novel combination of large- and small-scale farming, with effective regulation or procedures for conflict mitigation and resolution that protect small-scale farmers' rights within a dual system.

These problems must be solved as soon as possible. For instance, the number of youths in some regions of Asia and sub-Saharan Africa suggests that alternatives to agriculture are not available now or in the next generation at the necessary scale (Mueller, 2019). Young people would not stay in agriculture because of the hardships involved unless farming can be made more appealing. It is also important to note that new strategies, such as agricultural investments, must be developed if many young people in rural and urban areas are to be absorbed and given a fair standard of living (Proctor & Lucchesi, 2012). In Ghana, small-scale farming households going forward must be involved in agribusiness enterprises such as the rearing of animals as meat; selling of fruits, honey, and bee waxes; plant-based oil, shea butter, essential oils, and fats; medicinal plants and herbal medicines; bamboo and rattan products (Anokye & Adu, 2014). Numerous Ghanaians engage in either the production /or marketing of agricultural products across the various parts of the country. Ahenkan and Boon (2010) opined that about 20% of economically active Ghanaian citizens derive their income from non-timber forest products-related activities. In contrast, about 38% of the country's households also engage in trading activities relating to agribusiness enterprises (World Bank Group, 2018).

Mostly, agribusiness enterprises in Ghana cover small-scale products, including bamboo, mushrooms, black pepper, snails, honey, shea butter, and medicinal plants (Suleiman et al., 2017). It is estimated that a significant proportion of Ghana's agribusiness enterprises are dedicated to the production of several regions in the southern belt of the country. Estimates have it that bamboo production alone has covered about 300,000 hectares of land in the country (Anokye & Adu, 2014). Aside from the widespread engagement in

agribusiness enterprises among Ghana's citizens, several studies have pointed to its importance and contribution to the national economy and the betterment of individual lives.

According to Ferreira et al. (2020), agribusiness enterprises present nourishable income opportunities to rural communities in times of shortages and economic slag in the country and lead to the socioeconomic enhancement of most rural communities in Ghana. Earlier to this, Alex et al. (2016) also pointed to the fact that most rural communities in the country still depend on proceeds from gathering, using, and trading in agribusiness enterprises as a major source of their livelihood. It has also been echoed by Verma and Paul (2016), who reported that the significance of agribusiness enterprises in Ghana is evident in their intense concentration in the country's forest regions, which have been mainly dominated by local folks whose entire livelihood depends on these products. Reports by the World Preservation Foundation (2010) also indicated that the livelihoods of about 60 million indigenous individuals depend entirely on the forest and its related products. Agribusiness enterprises are also known to create about a million jobs worldwide, as it has been recorded that many million households, in one way or the other, rely on the income generated from engaging in Non-Timber Forest Products (NTFPs).

In the late 1990s, reports by the United Nations Food and Agriculture Organization (1997) suggested that about 80% of the developing world's population relies on non-timber forest products to meet their health and nutritional needs. The direction of global literature on non-timber forest products is not in any way different from the situation of Ghana and other African countries. For instance, Ahenkan and Boon (2008) indicated that at least 86% of farmers in Sefwi-Wiaso majorly relied on non-timber forest products for food, medicine, and revenue generation. In all, it can be concluded that non-timber forest products are an integral part of Ghana's livelihood economy as they have contributed in several ways to the socio-economic development and betterment of individual lives in the country. According to Chima et al. (2012), this is so because many people, through their

extractive occupations, interact with the natural forest to satisfy their fundamental requirements of food, shelter, and clothing.

The widespread cultivation of non-timber forest products in Ghana is known to have been due to political, social, ecological, and economic factors that boost its dominance in the country's forest areas. Ahenkan and Boon (2010) asserted that one critical factor promoting the dependency on non-timber forest products as an alternative source of income in the country is the strong conviction of the government and other state authorities about the potential of the non-timber forest products to significantly contribute to solving the prevailing high problem of malnutrition, poor health of local folks and intense poverty among farmers. This is because non-timber forest products are recognized to meet the needs of rural communities for food, shelter, and clothing, as indicated in the global statistics that about 350 million people rely on non-timber forest products for their household income (Ahenkan & Boon, 2008). These have been confirmed by Osei-Bonsu (2015), who asserted that the boosting factors for the massive engagement in gathering, collecting, and trading of non-timber forest products are its potential for ensuring food security, poverty reduction, and sustainable development. As it is the topmost priority of any state government to ensure the supply of basic needs to its citizens as well as guarantee economic development, the Ghanaian government has also instituted measures and interventions such as forest protection laws, subsidies, and other forms of technical support to farmers engaging in the production of non-timber forest products in the country as a means to promote its dominance among the farmers.

According to Raj et al. (2018), the increasing recognition of the socioeconomic impacts of non-timber forest products, coupled with the urbanization of most rural communities in the country, is the main driving force behind the increasing cultivation among many farmers in Ghanaian society. More so, other studies posited that the increasing demand for non-timber forest products in the international market and consumers' willingness to pay premium prices for some of the products in this group also plays a significant role in

its widespread among some farmers in the country (Endamana et al., 2016). Apart from the above-stated factors, reports by Bannor (2021) also indicated that the upcoming engagement in participating along the value chain of the non-timber forest products is also backed by the entrepreneurial training skills given to farmers and youths in the country.

Bannor et al. (2021) did not fail to point out that the chance of engaging in NTFPs depends on their proximity to the country's forest areas. The assertions of Bannor et al. (2021) were earlier stated by Abubakari and Mumuni (2020), who, in assessing the contribution of NTFPs in the Kumbungu district in Northern Ghana, concluded that in an attempt to supplement the low returns from their farming activities, farmers in the area had given massive consideration to NTFPs as a way of enhancing economic development and to support the livelihood of the farmers in the area. They also posited that the effective utilization of the NTFPs in the district was identified as the reason why the community is witnessing frequent development in its educational, health, and recreational affairs, catalyzing to encourage massive engagement and policies in favor of the NTFPs production. Ahenkan and Boon (2010) also indicated a recent rise in the certification of NTFPs globally, which is also one of the main boosting factors to the engagement in NTFP-related activities.

There are several production and marketing constraints that smallholder farmers in developing countries such as Ghana face, and this has reinvigorated the interest of governments, aid agencies, and agribusiness businesses in the formation of farmer groups to assist in addressing these difficulties (Abdul-Rahaman & Abdulai, 2018). As a result of these obstacles, smallholder farmers are urged to join farmer organisations where they may readily access resources and adopt methods that can help them to improve their production and livelihoods (Bouare, 2018). Thus, farmer cooperatives are viewed as springboards in enhancing productivity gains, poverty reduction, food security, and rural development as resources and agri-food value chain interventions are provided

effectively and efficiently to smallholder farmers (Verhofstadt & Maertens, 2014; Ainembabazi et al., 2017).

Kilchling et al. (2009) stated earlier that irrespective of the product quality, high prices could mean low sales volume since not many customers are willing to pay high for NTFPs due to their low knowledge about their health benefits. Other studies also posit that the prices of the NTFPs are also influenced by the type of market and the alternative marketing opportunities around them. This has been confirmed by Adam et al. (2013), who asserted that saturated markets significantly influence cash incomes from non-timber forest products because of the inadequate number of markets. The short lifespan of some of the products, such as shea nuts, mushrooms, and snails, is also heightened as a cause of the low prices for the products since the farmers are forced to quickly sell them off at any price so that they may not get rotten. Another challenge affecting the progress of the NTFPs in Ghana is that many customers do not know how to use or prepare some of the products for consumption or other activities; hence, they do not approach or purchase such products at all. For instance, most people have little knowledge of how to prepare mushrooms, snails, or edible orchids for consumption, and it has been reported that this is taking a significant toll on the sector (Adam et al., 2013).

3.6 Chapter summary

Ghana's economy is mainly based on agriculture, with about half of the population employed in some capacity along the agricultural value chain (i.e., from the producer to the consumer). Pressures on agricultural land and food production are expected to rise sharply shortly as the Ghanaian population grows. There is a need to improve agriculture growth, especially small-scale farming businesses since they account for a larger proportion of farmers in Ghana. Unequivocally, small-scale farming businesses in rural Ghana contribute largely to meeting food shortages. However, the farming business is

engulfed with several difficulties, such as low crop yields, poor soil fertility, pest and disease incidence, variations in weather conditions, lack of extension services, lack of farm input and cash credits, and low adoption of improved technologies. Given this, successive governments and other non-governmental agencies developed measures to revamp the poor performance of small-scale farming businesses in rural Ghana. The previous government has enacted several policies; however, the current agricultural program known as "Planting for Food and Jobs" has taken a critical look at the national agenda on agriculture, predominantly seeking to modernize Ghana's agricultural sector. Going forward, income diversifications and involvement in off-farm agribusiness enterprises, such as agro-processing, etc, should be encouraged in the rural farmers during the off-season.

CHAPTER 4: GHANA'S SMALL-SCALE FARMERS ACCESS TO MARKETS

4.1 Introduction

The previous chapter focused on small-scale farming businesses in rural Ghana forms the main emphasis of this chapter. The chapter also discussed the socio-economic contribution of small-scale rural farms in Ghana as well as the economic sustainability of small-scale farming businesses in rural Ghana.

The focus of this chapter is to examine smallholder farmer access to agricultural markets in Ghana across multiple scales. The first of this chapter provides a discussion on the access to market linkage institutions. This is followed by the assessment of smallholder farmer's access to local markets. Additionally, chapter also assess the international markets of Ghana's smallholder farmers. These include regional (ECOWAS) markets (other African) markets and world markets outside Africa.

4.2 Access to market linkage institutions

Small-scale rural farmers have always experienced a myriad of challenges that impedes their agricultural operations (Shapi, 2017). They are characterized with working with rudimentary hand tools such as cutlasses, hoes, mattocks and rakes usually under harsh weather conditions (Bjornlund *et al.*, 2020). Their agricultural activities are seasonal and usually involves a single production season for only a few months (Kom *et al.*, 2020). Produce from this single growing season are therefore expected to be used in feeding the farm family for the rest of the year where production activities are virtually nil (Guido *et al.*, 2020). A failure in the production season is therefore a major disadvantage to the entire farm family if there is no stored produce from previous seasons (Abokyi *et al.*, 2021). With all these complications and harsh living conditions, small-scale farmers are

usually risk-averse and always reluctant to amend their production techniques despite the associated promising persuasions (Bjornlund *et al.*, 2020).

Irrespective of the harsh conditions associated with the production activities of these small-scale farmers, they are well noted for their major contribution towards the food supply chain of many developing nations (Pawlak & Kołodziejczak, 2020). Based on their important roles in the food system, there has been growing concerns for smallholder farmers to shift from archaic traditional farming practices to more innovative ones (Njuki *et al.*, 2011). These shifts are expected to result in better farm incomes to the farmers through linking them to the appropriate markets. Due to these market connections, various organizations are exploring different strategies to integrate small-scale farmers into diverse markets (Saigenji & Zeller, 2009).

The phrase "linking farmers to markets" can refer to a wide range of endeavors, from the extremely tiny and localized to the extremely massive. The idea does, however, presuppose the growth of long-term commercial alliances as opposed to support for sporadic sales (Shepherd, 2007). Thus, linking farmers to buyers in advance of production creates the bedrock for farmers to potentially have as more assured market and often an agreed price, greatly reducing risk for farmers (Njuki *et al.*, 2011). Small-scale farmers that depend on agriculture in undeveloped nations have traditionally had difficulty accessing markets and marketing information. Their access to markets was hampered by issues like inadequate road infrastructure, illiteracy, financial limitations, inadequate communication tools, and lack of knowledge (Magesa, 2014). These small farmers sell their produce at the farm gate and neighborhood markets and rely on conventional forms of communication; hence, such farmers tend not to benefited from this because dealers, middlemen, and other chain participants take a substantial portion of their crop. As a result, agriculture makes minimal contribution to rural farmers' income, economy, and welfare (Shepherd, 2007).

It is also worth noting that, farmers have unique needs and are suited to different market types. According to Ferris et al. (2014), value chain projects can aim at three main types of markets. These are informal, formal, and structured markets. Informal markets are identified by minimal regulations and often lack taxation. Formal markets, in contrast, are more regulated, utilize standard weights and measures, and transactions are typically conducted within clearly defined legal parameters. Structured public markets are those organized by public sector purchasers who establish standardized contractual purchasing agreements with specific stipulations, such as procuring a certain percentage of their total purchases from small-scale farmers. The complexities of the different market systems are a typical reflection of the volume and value of trade, the product type being traded, and the number of market actors involved in the marketing system. All these formal, informal and the structured public markets can be carried out at the local, regional, continental or the global level. However, having access to these linkages by small scale farmers in order to derive the maximum benefits can be achieved through the following approaches.

4.2.1 Through information and communication technologies (ICTs)

A core principle of the Planting for Food and Jobs (PFJ) initiative is to enhance the marketability of the increased agricultural output by leveraging Information and Communication Technologies (ICTs), as outlined by the Ministry of Food and Agriculture (MoFA) (2017). ICTs play a crucial role in connecting smallholder farmers with markets, offering them timely and relevant marketing information. This technology facilitates informed decision-making for farmers regarding selling their produce and managing their farms. Consequently, the Ministry of Food and Agriculture has launched an E-agriculture initiative under the West African Agricultural Productivity Program (WAAP). This initiative aims to deliver agricultural services efficiently and affordably by utilizing internet-based technologies. It allows farmers and other participants in the agricultural value chain to access detailed, current information on market prices, management practices, and more.

By improving information exchange between traders and producers, lowering transaction costs, and assisting farmers in obtaining necessary inputs, this program significantly boosts farmers' market access and their ability to meet consumer demand (Ahmed et al., 2017).

4.2.2 Subsidies

Agriculture in developing countries have always been challenging. Factors such as financial constraints among others all limit small holder farmers' access to markets (Ferris et al., 2014). Small farmers often are constrained in terms of finance in accessing inputs and input markets. The PFJ initiative aims to alleviate the economic pressures on smallholder farmers by offering subsidies for fertilizers and seeds. The government of Ghana covers half of the retail cost for these inputs. Farmers are required to pay an initial 25% of the total price upon receipt of the inputs and settle the remaining 25% after the harvest season, according to MoFA (2017). The program ensures early and sufficient availability of either hybrid or improved seeds at reduced prices through private vendors. This allows farmers to obtain these essential inputs from authorized public and private sales points. Moreover, the fertilizer subsidy program boosts the adoption and application rates of fertilizers by ensuring they are plentiful and affordable. Private companies are engaged to purchase and deliver fertilizers directly to farmers in various districts and communities around the nation.

4.2.3 Promotion of partnership

The PFJ program aims to bolster both input and output markets by fostering partnerships among various agricultural stakeholders, including farmers, lead farmers, aggregators, input suppliers, farmer associations, and private agricultural businesses, as per MoFA 2017. It orchestrates cooperation with the Ministry of Health, Ministry of Education (in

alignment with the free SHS policy), Ministry of Trade and Industry, and the private sector to ensure a steady and accessible market for farm products. The initiative includes building new storage facilities near farming districts and renovating existing ones to facilitate efficient marketing of farm produce. This strategy helps farmers cover the remaining half of their input costs and mitigates the impact of seasonal price fluctuations, addressing a significant challenge in the agriculture sector (MoFA, 2017).

Improving market access for small-scale farmers can be achieved by delivering market information and establishing farmer organizations. Forming agreements between producers and buyers and grouping producers are essential steps towards bridging the gap between farmers and consumers, offering security to both parties. Farmer organizations play a pivotal role in fulfilling market requirements for volume, quality, and consistent supply through collective efforts, which individual farmers might find challenging to meet on their own (HODECT, 2010; Kaganzi et al., 2009; Ochieng, Knerr, Owuor, & Ouma, 2018).

Moreover, these organizations aid in creating networks between farmers, traders, and processors, thereby building social capital. Such enduring strategies enable farmers to gain both directly and indirectly, through enhanced market access or improved market possibilities (Aku et al., 2018). In the Babati District of Tanzania, the Africa RISING project, funded by USAID and executed by the World Vegetable Center in Eastern and Southern Africa, focuses on integrating vegetables into maize-centric farming to elevate nutrition and income for small-scale farmers. This project emphasizes the formation and strengthening of vegetable farmer organizations to provide information and connect with potential markets, ensuring the collective output meets the demands of larger regional markets (Africa, 2016).

4.2.4 Contract farming

Access to lucrative, value-added marketplaces is sometimes limited for smallholder farmers. Farmers find it difficult to transition from subsistence and barter to more productive forms of exchange when vital supporting activities like infrastructure and service supply are lacking (Stringer et al., 2020). Smallholders can be connected to value chains through contract farming methods, where buyers and farmers enter into a forward agreement for agricultural production (ILO, 2017). Out grower programs and out grower models are put into practice under the PFJ initiative. Such "out-grower" strategies produce a secured market, consistent prices, and increased access to technical help and inputs like hybrid seeds. Smallholders that engage in contract farming are given a direct sales agreement for a particular product and a certain market. Typically, the agreement is based on parameters like pricing, quality requirements, and sales quantities. An intermediary company like the MOFA typically supports contracting by securing the market, sourcing produce from small producers to aggregate supply levels, and overseeing quality. These companies frequently assist with funding and technology and assist in lowering risks for smallholders. Although they frequently obtain rates that are slightly below those of the current market, contracting enables farmers to access a more stable market (Ferris et al 2014).

4.2.5 Certification

Globally, smallholders make up the bulk of agricultural practitioners. Adhering to market standards, such as those established by EurepGAP, is essential for gaining and retaining access to international markets, especially within the European Union (Valk, 2005). There has been an increase in certification programs aimed at supporting the production and marketing efforts of smallholder farmers for over two decades. Implementing cost-effective certification systems is vital to prevent small-scale growers from being excluded

from the national and international economies, particularly in less developed nations. The adoption of EUREPGAP certification enables small-scale farmers to tap into international markets by ensuring their produce meets the accepted European standards for food safety, sustainability, and more (Bamunuarachchi et al., 2019). The PFJ program offers free technical training and guidance from extension workers to help farmers ensure their produce adheres to safety, quality, and certification standards recognized across Europe. This uniform approach to certification also translates into cost savings for farmers, as it eliminates the need for multiple audits against varying standards annually.

4.3 Access to local markets

Local markets describe the markets within the jurisdiction of an administrative country (Georgallis *et al.*, 2020). Thus, these are markets within the country of origin of the farmers producing the commodities in question irrespective of the spatial locations from the primary producers. For instance, in Ghana, farmers from the northern part of the country produce lot of groundnut and supply to the Techiman market, a market situated in the middle belt of the country where demand is high (Salifu & Baah-Mintah, 2017). Local markets are therefore considered as the most accessible form of market for the majority of small-scale farmers in developing countries (Fan & Rue, 2020). Owing to the non-existence of the tax system and other well-structured way of exchange between market players, local markets are usually classified as informal markets. Most of the products (80-90%) traded in these markets are agricultural commodities and the form of transaction spans from farm gate, roadside sales, village markets, rural assembly markets, and sales in the main urban wholesale and retail markets (Hawlet *et al.*, 2019).

Due to the limited use of standards for transactions, there is relatively low records of postharvest losses because there is a higher level of flexibility in value propositions based on the level of quality of the commodity in question. These therefore makes local markets

attractive to a wide variety of buyers and suppliers (Ferris *et al.*, 2014). The informal nature of the local markets is also regarded as a hub of opportunities for producers, wholesalers and retailers since trade barriers and transaction costs of operation are relatively lower and cheaper as compared to more formalized markets (Torres & Seters, 2016).

Amidst all these lower-level formalities, local markets tend to be associated with local authorities who control the markets and sometimes manipulate the market to benefit their political allies, families and other relations by limiting competitions and enforcing arbitrary stall fees (Ackah & Vuvor, 2011). There are also higher levels of unsanitary conditions, overcrowding, poor market information and transparency (Fan & Rue, 2020). With the low enforcement of quality standards, local markets are therefore characterized with food safety issues making it unattractive to the middle to high-class income earners and consumers, even though some still patronize them due to proximity, accessibility and low cost of produce (Ferris *et al.*, 2014).

4.4 Access to regional (ECOWAS) and other international market

One of the unique ways to drive the transformation and development of the African subregion is the consented effort to embrace integration at the regional level through the Economic Community of West African States (ECOWAS) (Pasara, 2020). For instance, since its inception in 1975, ECOWAS has achieved a wide variety of successes to its credit such as better crisis prevention and management, financial and macroeconomic integration, free movement of people amongst others (Sonko, 2022). ECOWAS, by its nature incorporates its members into an economic union and acts as an alliance on matters affecting its members in relation to other regional unions and non-members (Gavua, 2007). Its dominance nature of hedging its members against all forms of exploitation and intimidation by other regional unions and non-members is a great avenue

that facilitates marketing across the region. It ensures the strict adherence to marketing rules across the region by creating an intra-union flow of trade, relaxing the barriers of trade, factors and investment in marketing opportunities at the exclusion of non-members and other regional unions (Akwara *et al.*, 2013). Akwara *et al.*, (2013) also posited that ECOWAS provides infrastructural facilities that supports the globalization process of the African subregion especially in the areas of trade investment, communication, industrial production and security among its member states through its established intervention and peace enforcement force; the ECOWAS Monitoring Group (ECOMOG). In signing the treaty amongst members states, ECOWAS was “to ensure a common market through liberalization of trade among Member States by removing non-tariff barriers to establish a free trade area at the community level and the removal among Member States, obstacles to the free movement of goods” (Fajana, 2018).

Despite the reduction in tariffs across the region, there is the need to effectively regulate non-tariffs measures (NTMs) to enhance efficient market access and integration (Cadot *et al.*, 2015). The non-tariff measures are basically policy measures other than tariffs that have the potential of hindering trade amongst member states. The NTMs are regulations whose objectives are to ensure the proper protection of human health and environment sustainability such as; Sanitary and Phytosanitary (SPS) measures or Technical Barriers to Trade (TBTs). Negligence to these NTMs can hamper market access and eventually distort effective trade in the subregion (Latouche et al 2022).

The launch of the African Continental Free Trade Area (AfCFTA) aims to unify the continent into a single trading bloc, offering significant benefits to traders, consumers, and companies across Africa. With expectations to encompass a market of around 1.2 billion people and a combined GDP of about USD 2.5 trillion across all 55 member states of the African Union, AfCFTA is poised to become the world's largest free trade area since the establishment of the World Trade Organization (Ajambo & Emebinah, 2021; United

Nations, 2020). This development promises Ghanaian farmers an expanded marketplace for their goods, both locally and abroad.

In numerous developing nations, the engagement of smallholder farmers in formal markets is often minimal, as their agricultural production is primarily geared towards subsistence, with only a minor portion available for sale (Hlatshwayo et al., 2021). Even when these farmers do manage to produce excess goods, various obstacles hinder their access to formal markets (Adeoti, Oluwatayo & Soliu, 2014). These barriers range from the lack of available markets, inadequate marketing infrastructure, and insufficient surplus production to offset marketing costs, to limited experience in business negotiations and collective bargaining, poor product packaging, and a deficiency in marketing knowledge and market intelligence, among other issues (Adeoti, Oluwatayo & Soliu, 2014). Moving forward, the marketing policies such as AfCFTA and ECOWAS could guarantee smallholder farmers to access market with less stringent marketing measures.

At the continental level of trade, one of the recent and renowned agreement instituted to facilitate trade between African markets in the Continental Free Trade Area (CFTA) (Muchanga & Hogan, 2020).

These regional bodies therefore present a huge opportunity for small-scale farmers, middle people, and other small-scale manufacturers to explore these opportunities by trading their commodities to other markets in different countries following the promising objectives of the establishment of these intercontinental trade agreements.

Apparently, in sub-Saharan Africa, the inability of agricultural producers and agro-processing firms to exploit developing opportunities in domestic market may be due to the poor enabling business environment. Gelb, Meyer, and Ramachandran (2014)

asserted that manufacturers faced with the link to high transport, energy, and regulatory compliance costs.

4.5 Chapter summary

The chapter examines smallholder farmer access to agricultural markets in Ghana across multiple scales - from local village markets to regional ECOWAS networks, the pan-African Continental Free Trade Area (CFTA), and global export channels. It analyzes participation of smallholder cultivators across informal local markets that lack standards but offer flexibility, versus more formalized regional and international channels requiring quality and volume guarantees. Access barriers like infrastructure, market information gaps, bargaining power limitations and stringent standards are assessed. At local levels, upgrades around storage, hygiene and standardization can expand market access. Regional bodies like ECOWAS and CFTA enable cross-border trade but require managing non-tariff barriers. Globally, organizing smallholders into cooperatives helps meet strict formal buyer demands but risks crowding out weaker farmers. The analysis reveals gaps in commercialization readiness among smallholders across market contexts while highlighting priority areas for interventions around aggregation, capacity building, logistics, and infrastructure to cement market linkages essential for raising productivity and incomes.

CHAPTER 5: THEORETICAL AND CONCEPTUAL FRAMEWORKS

5.1 Introduction

The previous chapter examined the state of smallholder farmer market access in Ghana across geographic scales - from informal village-level local markets to more formalized regional West African markets under ECOWAS, the pan-African Continental Free Trade Area (CFTA) enabling commerce with other African nations, and global export channels linking to international buyers.

This chapter introduces the theoretical and conceptual frameworks employed in the study. The theoretical framework incorporates social justice, empowerment theories, and the Theory of Change (ToC), emphasizing their relevance in the context of development programs. The conceptual framework adopts a program logic approach focusing on inputs, outputs, and outcomes/impact. These frameworks provide a structured approach for evaluating the PFJ program's effectiveness in enhancing market access for rural farmers.

5.2 Social justice theory

Social justice refers to the philosophical concept and political pursuit of creating a fair, equitable and inclusive society where all individuals can realize their fundamental rights and fully participate in social, economic and political spheres regardless of their identities and demographic attributes (Miller, 1999; Barry, 2005). Historically, the notions of equality, fair treatment under the law and moral obligations towards upholding human dignity trace back thousands of years in various ethical and religious traditions (Ishay, 2004). However, social justice as a more systematic interdisciplinary field melding moral philosophy, legal theory, political values and public policy is considered to have coalesced

relatively recently during the 18th and 19th centuries alongside watersheds like the Enlightenment, rise of modern civic nationalism and the Industrial Revolution (Fleischacker, 2004; Novak & Adams, 2015).

Enlightenment thinkers like Thomas Paine highlighted principles of intrinsic equality in their political critiques while grappling with the paradox between natural rights, revolutions overthrowing old regimes and persisting inequalities in newly democratic orders (Barry, 2005). Utilitarian philosophers like Jeremy Bentham developed early frameworks of assessing justice through the lens of maximal welfare realization in society (Rawls, 1971). Growing labor unrest and inequality in the wake of industrialization sparked debates over economic fairness and the role of the state (Fleischacker, 2004). By the mid-19th century, seminal works like that of John Stuart Mill cemented foundational linkages between justice and political economy (Mill, 1848). Legal reforms aligned with social justice took hold by the turn of the century.

Over the 20th century, social justice got propelled to the forefront through struggles against colonialism, racism, patriarchy and economic exploitation that invoked the interlinked nature of civil, political and economic rights (Ishay, 2004). Democracy deepening through franchise expansion struggles enabled marginalized group participation in governance. By the 1960s, the integrated paradigm advancing equitable inclusion, material redistribution and cultural recognition of minorities formed a cornerstone of progressive politics (Miller, 1999; Sabbagh & Schmitt 2016). Today the interdisciplinary field engages with a multiplicity of identities, evolving structural barriers and policy priorities - enriched by grassroots activism. Yet core concerns retain continuity across decades that contemporary theories build on (Sabbagh & Schmitt, 2016).

5.2.1 Tenets of the social justice theory

A fundamental tenet of the social justice theory is that all human beings have equal worth and dignity regardless of social identities, economic status or demographics (Capeheart & Milovanovic, 2020). This principle of intrinsic equality forms the basis for pursuing equity - which requires fair distribution of responsibilities and benefits in society. As various groups have suffered historical oppression, actively addressing barriers they continue facing becomes imperative for substantive justice. Policies must account for such legacy marginalization that has denied vulnerable groups from realizing their potential. Equity measures thus get contextualized as leveling the playing field and upholding rights rather than preferential treatment (Barry, 2005).

Flowing from equality is the next tenet that all people deserve sufficient provisions for participating fully and advancing in social, economic and political spheres (Nussbaum, 2003). Simply providing nominal access to facilities is not enough. Genuine participation requires customized resources and opportunities that enable diverse individuals and communities to meaningfully exercise capabilities without normalized exclusions. For instance, programs may need flexible eligibility terms, disability accommodations, demographically conscious design and localized delivery to facilitate access across gender, racial and other demographic lines instead of one-size-fits-all approaches Wang 2018).

Beyond respecting human diversity, social justice also necessitates actively remedying historical exclusions and contemporary imbalances of status, resources, and power between groups (Costa, 2014). Whereas the previous tenet upholds inclusion and pluralism, this tenet recognizes that overcoming injustice requires affirmatively building equity. This demands assessing systemic disparities, targeting development policies based on group disadvantages, and ensuring access matches differentiated needs. Without such structural change and material redress, embracing diversity becomes an

empty gesture that merely tolerates continuing inequality (Johnson & Parry, 2022). This therefore a move beyond passive inclusion or tolerance of differences, towards actively building equity and redressing imbalances of status, power, and access to the resources required for groups to thrive together.

The last tenet of the social justice theory is that equitable and durable social change relies on participatory praxis with affected communities at the center (Hutton & Heath, 2020). This means processes to redress injustice must enable those facing marginalization to help shape the solutions intended to serve them, rather than simply receiving top-down prescriptions. Genuine participation provides both critical understanding of structural causes as well as active involvement in informing and mobilizing for reform efforts (Walter, 2017). Policies should foster grassroots engagement capacities and embed participatory mechanisms allowing disadvantaged groups to analyze issues collectively and define priorities attuned to their lived realities. Without centering the perspectives of those facing injustice, even benevolent policy interventions risk exacerbating disparities. Thus the last principle recognizes that just outcomes require inclusive and participative means. Progress depends on supporting marginalized communities to move from passive recipients to active change agents directing systemic changes towards greater equity and redress.

5.2.2 Criticism of the social justice theory

While social justice theory as an ethical paradigm has seen rising advocacy, it has equally faced longstanding critiques from an array of skeptical perspectives. A core critical contention is that the expansive flexibility in interpreting social justice's conceptual ideals fosters deployment as a rhetorical vehicle to advance partisan visions of ambitious societal reform rather than a consistent framework for evidence-based assessment of policies (Hayek, 1976; Tebble, 2009). By embracing sweeping notions of dismantling

systemic injustices without defining boundaries, the concept allegedly risks becoming an ideological hammer to impose radical changes linked more to identity politics than neutral principles (Cochran-Smith et al 2009).

Relatedly, the prominent focus within social justice discourse on confronting historical oppressions and calling out group privileges is portrayed as enflaming resentments rather than nurturing social cohesion (McWhorter, 2021). By framing equity as requiring corrective action from the privileged on behalf minorities, critics argue the paradigm splits society into opposing camps rather than uniting people under common goals.

Additionally, sceptics highlight that translating egalitarian ideals into substantive policies requires balancing complex administrative and economic tradeoffs missing from the paradigm's ambitious vision (Nozick, 1974). Social justice theory arguably overlooks risks like capital flight or skill shortages that rapid reforms may unintentionally catalyze. Additionally, some highlight that aggressive redistributive or preferential efforts to equalize group outcomes conflict with traditionally prized liberal ideals of formal equality under the law, due process, and individual rights against state overreach (Fuller, 1964). Thus, despite its appeal, critics see social justice as sometimes instrumentalized in divisive or impracticable ways potentially undermining civil liberties. Finally, the social justice theory allegedly relies predominantly on strong moral reasoning making objective, consistent assessment of reforms exceedingly complex (Arrow, 1973; Tikly, 2011). The subjectivity risks justifying policies based on emotional appeal rather than evidence.

5.2.3 Justification for the social justice theory

Ghana's Planting for Food and Jobs (PFJ) initiative represents one of the most ambitious government efforts aimed at transforming the agricultural sector and driving broad-based farmer prosperity through productivity upgrades, resilient livelihoods and cementing

market linkages. However, the country's checkered history shows well-intentioned development interventions have frequently floundered due to issues like elite capture, exclusion of marginalized communities, concentration of gains among better-off farmers and lack of participatory planning - jeopardizing impact (Ragasa et al., 2018). Applying a social justice theory lens enriches analysis - moving focus beyond material incentives and aggregate productivity to confronting systemic and structural barriers that have historically impeded securing broad-based agricultural advancement (Abalo, 2017; Chinsinga & Cabral, 2010). In particular, the research goal of examining major market access and linkage improvements facilitated by PFJ requires assessing not just provision but whether vulnerable farmers can meaningfully leverage such services to upgrade welfare. The capability perspective presses whether smallholders have the awareness, financial resources, skills and cultural accommodation needed to utilize facilities like insurance, banking, warehousing etc. or does inequality in access opportunities persist (Kwapong, 2013). This inquiry into realizing genuine participation parity is as pivotal as documenting availability or usage rates of provisions. Further, determining socioeconomic factors driving successful market linkage under PFJ warrants scrutiny through equality and diversity tenets of social justice theory (Young, 1990; Fraser & Honneth, 2003). Impact variations based on gender, ethnicity, age, asset bases and geographical location can reveal where social marginalization and discrimination restricts opportunities - pressing the case for structural reforms over just skill training or financial incentives alone (Ragasa et al., 2018; Nussbaum, 2003).

Additionally, the research objective of assessing PFJ's farm income impacts makes an imperative case for equity-focused analysis (Miller, 1999; Barry, 2005) - specifically, have economic gains been broadly shared across differentiated beneficiaries or concentrated narrowly among already relatively privileged groups? Unpacking disparate outcomes sheds light on areas where enduring historical exclusion may be undermining policy visions. Finally, elucidating bottlenecks that smallholders continue facing like limited bargaining power and lack of customized production support helps situate such barriers

as symptomatic of systemic marginalization. This presses the need for structural reforms oriented towards justice aims of dismantling inequity (Young, 2011). Social justice praxis also foregrounds that lasting solutions require participatory developmental planning where farmers shape initiatives meant to serve them through deliberative engagement, co-learning and democratized monitoring (Freire, 1970; Nussbaum, 2003).

In essence, by embedding multidimensional considerations of access parity, inclusion, concentrated privilege, political economy risks and participatory action - social justice theory profoundly expands the analytical framing around interventions like PFJ. It enriches diagnosis of enduring challenges and solutions for securing equitable agricultural commercialization and advancement (Darkwah, 2013). The paradigm compels investigating where enduring limitations stem from historically shaped structures and exclusion rather than solely farmer motivation or capability gaps (Abalo, 2017; Ragasa et al., 2018). Thereby it informs cultivated policy reforms attuned to ground realities.

5.3 Empowerment theory

The empowerment theory is a conceptual paradigm and political approach focused on expanding autonomy, participation, and civic capacity for marginalized populations and disadvantaged communities to enable them to gain control over issues and decisions impacting their lives (Perkins & Zimmerman, 1995). At its core, empowerment theory centers the inherent capabilities within individuals and social groups that structural inequities and institutional barriers have denied them from fully realizing in society (Wilkinson, 1998). The intellectual history of empowerment theory traces back to the rise of consciousness-raising ideologies and mass mobilization of marginalized groups in the 1960s across movements related to civil rights, anti-war activism, and feminism (Staples, 1990). Through the 1980s, the empowerment theory accelerated across development

studies seeking alternatives to limiting paternalistic poverty interventions (Kabeer, 1999). Since then, vast scholarly and grassroots engagement with empowerment theory related to health, education, gender, race, disability and economic sectors validate the paradigm's resonance for advancing inclusion and capabilities (Kabeer, 1999; Zimmerman, 2000; Balcazar et al., 1996; Al-Makhamreh & Lewando-Hundt, 2008).

5.3.1 Tenets of empowerment theory

Empowerment theory holds that marginalized groups themselves must direct social change rather than remain passive recipients of external interventions by dominant groups (Zimmerman, 2000). The priority focuses on building efficacy, conscious awareness, and grassroots capabilities within oppressed communities for self-determined betterment tailored to lived realities, as opposed to mainstream planning from privileged technocrats (Staples, 1990; Rappaport 1987). This demand facilitating mobilization and organization of disadvantaged groups' own visions and assets versus engendering dependence on bureaucratic welfare systems (Kabeer 1999).

Progress markers center on expanding substantive civic participation and public leadership roles for marginalized populations, not token inclusion, across decision-making impacting their lives. This spans policies, resource allocations, consultative forums shaping reforms meant for minority groups, and oversight processes from local to state levels (Hur 2006; Zimmerman & Warschausky, 1998). Such democratic engagement enables co-creation and collective efficacy to achieve change. Empowerment theory cultivates structural critique on systemic forces causing marginalization so as to spur collective mobilization, rather than internalized self-blame (Freire 1970). Barriers reflect dysfunctional institutions not individual deficiencies. Fostering wider dialogue on unearned privilege can create allies to challenge inequality (Blackmore 2013).

In essence, empowerment theory offers a context-grounded paradigm for fundamental social change upholding equal rights, dignity and capabilities (Staples, 1990). It moves beyond enhancing coping capacities within oppressed groups to dismantling discrimination. This demand restructuring and decentralizing inequitable power relations concentrating authority with dominant classes (Turner & Maschi 2015). Progress requires altering the very scaffolding of social systems, not incorporating minorities into unchanged structures.

5.3.2 Criticism of the empowerment theory

A common critique is that empowerment practice excessively focuses on self-development, self-help, and personal efficacy within oppressed groups without adequately tackling wider societal change (Jackson et al., 2022). Critics argue stimulating isolated bottom-up actions like community garden projects or microcredit collectives overlook the need to challenge exploitative neoliberal capitalist systems concentrating wealth amidst deep poverty (Cruikshank, 1999). Such hyperlocal focus on capacity nurturance risks burdensome self-reliance ethos for marginalized sections facing structural barriers needing state intervention (Auerbach et al., 2014).

Further the radical consciousness-raising spirit of empowerment faces threats of institutional appropriation and depoliticization (Kabeer, 1999). Officially sanctioned tokenized participation forums or watered down psychological empowerment trainings pay lip service allowing status quo maintenance (Staples, 1990). In some global health or development bureaucracies for instance, empowerment gets reduced to patients “complying” with prescribed solutions or aid beneficiaries dutifully running donor-determined projects (Baaz et al., 2017). Such bureaucratized versions dilute bottom-up energies for transforming underlying paternal relations.

Additionally, the idealism surrounding participatory, power-sharing approaches like empowerment theory often confront deep-rooted bureaucratic inertia, administrative reluctance over opening spaces for democratic course correction by beneficiaries and backlash from elite interests feeling threatened (Cornish et al., 2014). For instance expanding marginalized communities' oversight can reveal mismanagement or corruption jeopardizing staff. Entrenched norms of planning for not by communities dies hard (Mansuri & Rao, 2013). Reactionary public attitudes regarding preferential inclusion, quick redistributive reforms also impede political adoption. So in essence, despite its transformational orientation, aspects of empowerment theory remain contested on philosophical as well as pragmatic grounds

5.3.3 Justification for the application of the empowerment theory

Ghana's Planting for Food and Jobs (PFJ) initiative launched in 2017 aimed to catalyze a transformation in the lives of smallholder farmers through revitalizing agriculture. However, embedded developmental challenges facing rural cultivators stretch beyond access to inputs and financing to historically shaped political marginalization and exclusion from policymaking processes determining their own futures. The empowerment theory holds indispensable lessons for realizing both productivity advancements and political transformations essential to uplift millions from poverty in an equitable, dignified and sustainable manner.

At its core, the empowerment paradigm compels shifting the vantage point from material incentives to expansive notions of rights, capabilities and public participation (Page & Czuba, 1999). It forces confronting why subsistence farmers lack awareness of schemes supposedly meant for their welfare or remain apathetic to intervening agencies' outreach efforts in the first place (Mansuri & Rao, 2013). Applying empowerment lens would press PFJ administrators to reflect whether their staffing orientations, messaging content,

engagement models may be reinforcing historically internalized self-doubts over rural communities' own efficacy rather than nurturing consciousness of structural socio-political forces undermining advancement for decades (Staples, 1990).

Applying an empowerment theory lens aligns tightly with the core research objectives of this study focused on evaluating the Planting for Food and Jobs (PFJ) programme's effectiveness in improving smallholder farmer market access and linkages in Ghana. In particular, the goal of examining major support services and market improvements facilitated by PFJ requires going beyond documenting nominal provisions to assessing whether vulnerable farmers are genuinely empowered to leverage such services based on self-determined needs. Here the theory spotlights participatory processes enabling communities to drive solutions for issues like storage, transportation, aggregation that they identify as priorities in their commercialization journey.

Likewise, determining key success factors for farmer market linkages under PFJ warrants investigating group efficacy, organizational strength and policy engagement capabilities that can address structural marginalization. An empowerment view situates lingering constraints as symptoms of disempowered systems rather than farmer motivational limitations - pressing for reforms that redistribute controlling stakes to farmers themselves. Additionally, the research objective of evaluating PFJ's economic impacts requires equity-conscious analysis of whether gains reach the most disadvantaged or widen inequality. Here again, an empowerment lens focuses on building farmer capacities and leadership to uphold accountability around resource allocation and design choices.

Finally, elucidating persisting bottlenecks for smallholders compels structural critique and consciousness-raising regarding roots of marginalization shaping policy gaps. By embedding such multi-dimensional considerations, empowerment theory profoundly expands the framing for agricultural development analysis, uplifting participation, dignity and self-determination.

5.4 Theory of change

Theory of change is an outcomes-focused conceptual and evaluation approach increasingly used in social policy and program planning across fields like international development, education, and public health since the 1990s (Stein & Valters, 2012). Historically, foundations and pioneering applications of theory of change emerged from the work of researchers and evaluators at groups like the Aspen Institute Roundtable on Community Change in the 1990s. They aimed to bring greater intentionality and causality analysis into the design of complex community initiatives tackling deeply rooted socioeconomic issues (Connell & Kubisch, 1998).

5.4.1 Tenets of theory

Theory of change upholds several core principles distinguishing it from other program planning approaches according to scholars like Vogel (2012) and Stein & Valters (2012). A key emphasis lies in orienting planning around aspirational goals and valued long-term outcomes instead of starting from available solutions or resources at hand. This outcome-focused framing compels working backwards towards mapping requisite activities and causal linkages to attain objectives (Connell & Kubisch, 1998). Theory of change also makes explicit the contextual factors and underlying assumptions that influence change processes based on best available evidence. Rather than perceived as linear, it employs an iterative approach using data feedback loops to periodically revisit and update change pathways implicated in achieving maximum impact.

A seminal emphasis in theory of change practice involves structuring program design by focusing first on clarifying long-term goals and priority outcomes instead of automatically working from available solutions, habitual activities or resources at hand (Anderson, 2005). This desired results-centric frame compellingly orients collective energy towards

more aspirational, thoughtful planning - what changes do target beneficiaries urgently need, what outcomes signal measurable improvement on an issue, what goals reflect shared ambitions on progress markers if resources were no barrier. Such participatory outcome envisioning then challenges teams to work backwards mapping activities logically connected to actualizing this evaluative vision across activity-output-outcome linkages (Vogel, 2012).

Relatedly, theory of change provides a framework to systematically surface and test assumptions around how and why particular interventions and measures undertaken are expected to catalyze results (Reisman et al., 2007). Making explicit the rationales, change theories, contextual risks and mitigation strategies that undergird initiative plans enables more responsive learning amid complex realities facing social challenges (Belcher et al., 2022). Rather than perceive as mechanistically linear, theory of change calls for reflective iteration using empirical feedback to strengthen causal links and optimize resource allocation where data reveals gaps between anticipated versus actual achievements on the ground (Stein & Valters, 2012).

Given initiatives seeking societal improvement inherently crosscut the interests, realities and cooperation needs of diverse actors, theory of change practice upholds inclusion (Taplin & Clark, 2012). It provides a structured collaborative process for stakeholders ranging from impacted communities to policy administrators to jointly wrestle with framing long-term goals, secondary outcomes sought, requisite activities by respective players and shared metrics signifying progress (Vogel, 2012). Such participatory planning surfaces varied vantage points, mobilizes localized insights on change levers while enabling buy-in towards collectively upheld results frameworks minus which attaining ambitious system-level change stalls.

In essence, anchoring initiative design around participatory outcomes envisioning, causal analysis and cooperative accountability offers a more promising pathway to remedy

complex development challenges (James, 2011). This agreed north star provides grounds for reconciling philosophical differences under aligned theory of change logic models backed by empirical review. Thereby supporting course refinements attuned to emerging realities before initiatives stall substantially off-track.

5.4.2 Criticism of the theory of change

A common critique is the tendency towards overemphasis on determinism embodied in detailed change pathways mapping that suggest predictability of complex social change processes (Belcher et al., 2022). However, proponents counter that practical theory of change implementation fundamentally centers adaptation. The aim is offering a thinking tool not blinders - providing tentative yet explicit logic chains whose underlying assumptions require continual re-examining through lived evidence to enable flexibility where realities deviate from projections (Valters, 2015).

Critics also highlight risks of formulistic, bureaucratized applications by managers seeking accountability to the detriment of meaningful utility (James, 2011). But this limitation manifests inadequate adoption rather than intrinsic conceptual constraints. Genuine theory of change practice upholds spirit of reflective learning not administration alone. Still tendency of window-dressing complex collaborative initiatives using the language of outcomes and assumptions sans the demanding deliberations remains a challenge.

Further some critique the potential for overly narrow predefined solution pathways that emerge from processes overwhelmingly shaped by dominant expert voices rather than grounded community priorities and indigenous knowledge central to social change (Belcher et al., 2022; Lebel et al., 2022). Yet meaningful practice argues for plurality of framings, egalitarian participation etc. from the outset. Overall, when mobilized sincerely, theory of change offers indispensable scaffolding in the struggle to remedy entrenched

societal problems from poverty to climate risks (Valters, 2015). But suboptimal, tokenistic applications risk hampering meaningful utilization of this promising paradigm aimed at transformative change.

5.4.3 Justification for the application of the theory of change

Adopting a theory of change approach carries invaluable potential to strengthen both the conceptual planning and practical implementation of complex, multi-stakeholder initiatives like Ghana's flagship Planting for Food and Jobs (PFJ) program in achieving sustainable agricultural transformation and rural farmer welfare goals. The PFJ program represents one of the most ambitious attempts by the state to catalyze a transformation in smallholder productivity and livelihoods through interventions spanning input subsidies, institutional capacity building, mechanization access and market linkage support. However, past governmental efforts have frequently fallen short of achieving enduring large-scale impact on the ground for remote, marginalized farmers. This pressing challenge makes PFJ a ripe opportunity to apply a theory of change approach for enhanced outcomes.

At its essence, the theory of change methodology would compel those involved in spearheading PFJ's vision and rollout - from political leaders to Ministry officials, agricultural researchers and district officers - along with grassroots stakeholders like farmers groups to engage in structured collaborative deliberations focused on mapping long-term shared aspirations rather than just immediate outputs (Connell & Kubisch, 1998). What constitutes the future prosperous vision for beneficiaries 15 years from now and what measurable priority outcomes signal progress on that economic and social transformation journey at periodic milestones (Vogel, 2012)? Anchoring planning in such outcome envisioning frames would direct attention towards more transformational goals aligned to people's real-world priorities rather than status quo.

Likewise, employing theory of change tools would enable methodically surfacing the implicit assumptions behind the causal pathways prioritized within PFJ's complex mix of production, resilience and market-oriented interventions and the ramifications when assumptions breakdown (Belcher et al., 2022). For instance, the links expected between provision of warehousing infrastructure to post-harvest loss reduction to income gains. Explicating rationales allows strengthening attribution analysis - clarifying what intermediate outcomes are indispensable for realizing wider impacts (Stein & Valters, 2012).

Additionally, operationalizing theory of change has potential to profoundly expand participatory planning, implementation and monitoring processes across the sprawling, interdependent PFJ initiative for greater localized ownership and agile coordination (Valters, 2015). Farmers groups would be involved as stakeholders, not just beneficiaries, with avenues to transparently shape interventions addressing diagnosed challenges in their agricultural transformation journey. The structured deliberations forum can uphold accountability across public, private and community partners for collaborative course correction guided by empirical results. Thus, the embedding theory of change thinking across planning, partnerships and performance tracking holds transformative possibilities for large-scale policies like PFJ vis-à-vis delivering context-attuned, devolved interventions that uplift farmer agency and capabilities while advancing national development.

5.5 Conceptual framework

While the underlying theoretical framework for this study remains ToC, this study adopts the program logic approach in developing the conceptual framework. Using the logic approach is consistent with the view of Organizational Research Services (2004) and Levin (2007), who state that program logic is the specific application of ToC to program

evaluation and that program logic framework (PLF) expresses ToC in a concise form. Just like ToC, PLF is a planned social change tool consisting of project's goal, activities, and anticipated results (Sari, 2020; Serrat, 2017; Schmidt, 2015; Shakman & Rodriguez, 2015).

Figure 5.1 illustrates the conceptual framework that has three components namely inputs, outputs, and outcomes/ impact. The concern of this study is the input and output and the green parts of the outcome. Based on the ToC that implies developing, managing, and evaluating interventions with the expectation that an intervention will contribute to an intended result (Mayne, 2015:119), it is argued that effective management of PFJ resources and barriers (inputs) will have positive impact on interventions targeting small-scale rural farmers (outputs) resulting in them gaining access to markets (outcomes).

In a logic framework parlance, inputs are what is invested as well as resources used and barriers to programme objectives (Shakman & Rodriguez, 2015). These could include, staff time, money, planning time, materials, equipment's, space, and other external partners as well as impediments to the program success or technical expertise, relationship, and personnel (Shakman & Rodriguez, 2015). Inputs envisaged for the PFJ are resources invested including human, financial, material as resources and trade barriers, rural customs, and attitudes of program officials as barriers.

Outputs are what the programme does with inputs to achieve goals. Activities like events and workshops, shows, informational materials and training advice constitute interventions in program logic (Shakman & Rodriguez, 2015). As stated earlier, the program specifically targets small-scale farm owners (FAO, 2015). Therefore, small-scale farm owners represent the audience (Shakman & Rodriguez, 2015). The interventions and audience are what is known in program logic parlance as output (Shakman & Rodriguez, 2015). markets. Mid-term outcome (6 -10 years), for gaining improved access while the long-term outcome (10-15 years) implies gained good market access.

The outcomes are the expected results of the project or program (Watt, 2014; Porter, 2020). The short-term outcomes of the PFJ are conceptualised as gaining some access to (i) institutions where they can sell their produce or get market linkage advice; (ii) national markets (iii) Ecowas markets (iv) African markets; and (v) world markets. The changes that take place for small-scale rural farmers is divided into short-term outcome (1-5 years) which entails, gaining some access to previously inaccessible institutions and markets.

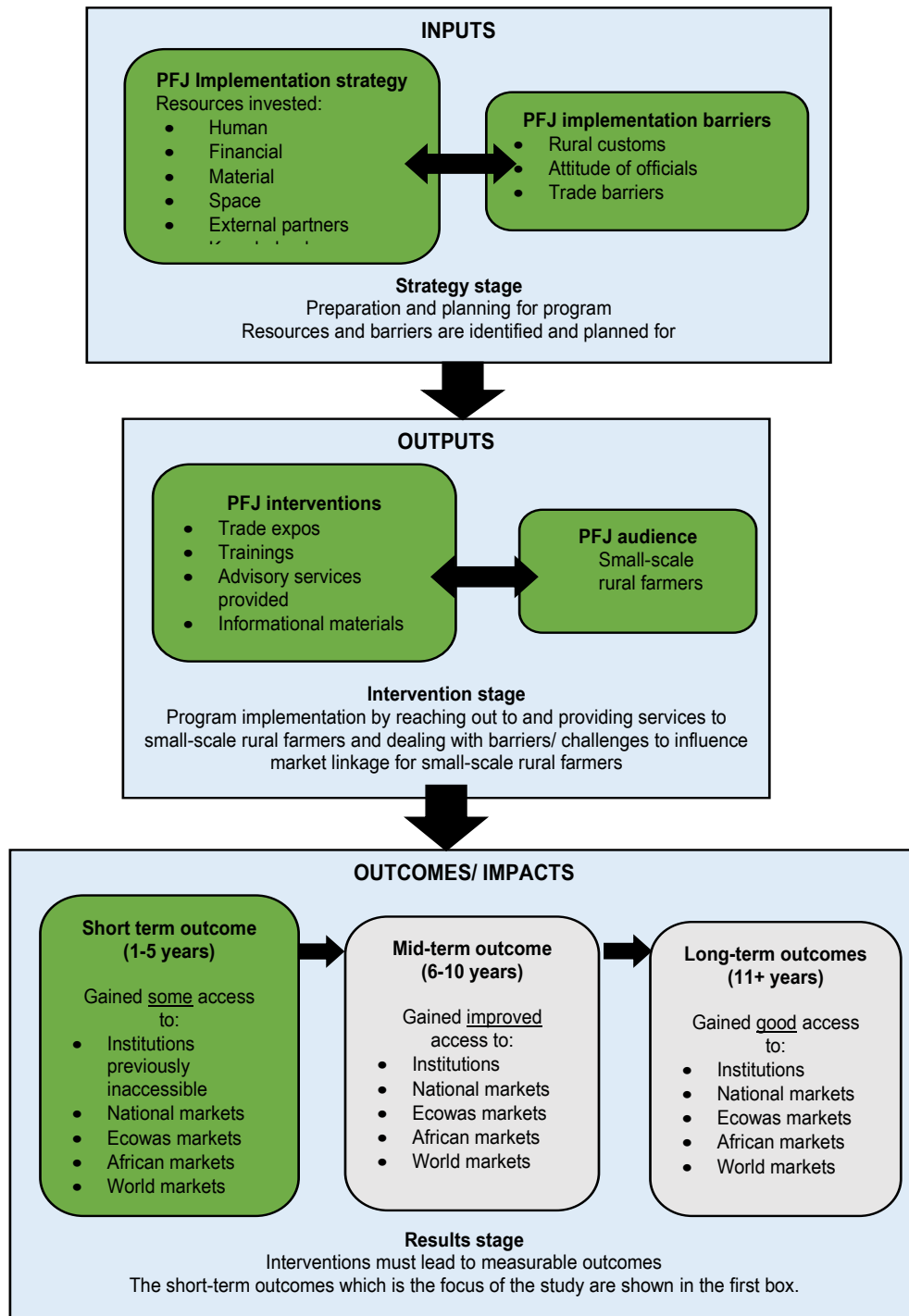


Figure 5.1: Conceptual framework

5.6 Chapter summary

This chapter introduces the theoretical and conceptual frameworks used to evaluate Ghana's Planting for Food and Jobs (PFJ) program aimed at improving smallholder farmer market access and incomes. Theoretically, it applies social justice theory to assess fairness, equity and inclusion; empowerment theory to evaluate grassroots participation and structural change; and theory of change for outcomes-focused planning anchored in long-term goals and assumptions testing. Conceptually, it adopts a program logic model linking inputs like financial resources invested and barriers like rural attitudes; outputs like production interventions and smallholder farmer targeting; to outcomes like short and long-term market access gains. Together these theories and framework enrich analysis beyond material incentives to confront historical marginalization of farmers, support capabilities and center participatory advancement. The rationale is evaluating a complex national initiative tackling rooted challenges requires going beyond simplistic inputs-outputs accounting to framing that prioritizes inclusive, empowering processes and outcomes.

The chapter justifies applying these multidimensional lenses because the PFJ program represents one of Ghana's most ambitious agricultural transformation attempts needing nuanced examination. Past efforts have fallen short on participation, equity and sustainability despite provisions. The research aims to assess if PFJ enables genuine market access and income improvements for vulnerable farmers by confronting structural barriers, not just aggregate productivity. The theories compel confronting historical exclusion patterns, capability barriers beyond provisions, and planning grounded in beneficiaries' priorities. Thereby revealing where transformative change requires not just inputs but conscious efforts to remedy marginalization through participatory, empowering and equitable models centered on social justice.

CHAPTER 6: RESEARCH METHODOLOGY

6.1 Introduction

This section discusses the methodological framework followed in the study. It includes the research paradigm, design, approach, methods of data collection and analysis, population and sampling, validity and reliability assurance and ethical considerations. The methodological framework provides a structured framework for conducting the study and gathering and analysing the necessary data to address the research questions and objectives.

6.2 Research paradigm

A research paradigm refers to a set of beliefs, values, and methods that guides how research is conducted and interpreted within a particular discipline. It encompasses the theoretical frameworks, methodologies, techniques, and assumptions that researchers adopt to explore and understand phenomena. For Kaushik and Walsh (2019:1), the term research paradigms refers to “conceptual and practical “tools” that are used to solve specific research problems”. The most common paradigms in social and scientific research include positivism, which relies on observable, measurable facts and logical analysis to understand reality; interpretivism, which emphasizes understanding the subjective meanings and experiences of individuals; and pragmatism which (Kaushik & Walsh, 2019:1) consists of a mixture positivism and interpretivism. This research is conducted using pragmatism.

Researchers agree that each paradigm offers a different ontological and epistemological perspective on how knowledge is constructed, influencing the choice of research questions, methods of data collection and analysis, and how findings are interpreted and

applied (Rivas, 2015; Moon et al., 2016; Creswell & Creswell, 2017; Kaushik & Walsh, 2019). Epistemology and ontology are foundational concepts in the realm of philosophy, particularly in the study of knowledge and the nature of reality. These two issues are briefly explained below.

6.2.1 Ontology

In a broad sense, ontology, concerns itself with the study of being and existence and explores the various categories of being, the nature and structure of objects, their properties, and the relationships between them (Rivas, 2015). In other words, ontology addresses the fundamental aspects of what exists or the nature of true knowledge. In the context of research, ontology explores the assumptions researchers make about the world they are investigating. Ontology raises questions about what types of entities exist in the social or physical world and the relationships between these entities (Rivas, 2015). These ontological assumptions guide the approach to understanding and studying phenomena (Rivas, 2015). In other words, ontological beliefs determine what a researcher believes can be known about a subject, how that knowledge is structured, and what constitutes evidence or truth in the context of the study.

Two ontological positions are assumed in research are the objectivist ontological stance and the subjectivist ontological stance. An objectivist ontological stance is founded on the belief that reality is external and independent of human perception, leading to the adoption of quantitative methods to study phenomena as measurable objects (Rivas, 2015). Conversely, a researcher who holds a constructivist ontological view believes that reality is socially constructed through human interactions and subjective experiences, prompting them to use qualitative methods to understand the complexity of social phenomena (Rivas, 2015). Ontology, therefore, shapes the foundation of research methodologies, influencing decisions on research design, data collection, and analysis. It

helps researchers to articulate and justify their approach to studying a phenomenon, ensuring that their methods align with their underlying beliefs about the nature of reality (Rivas, 2015). A third belief that has emerged in recent time can be described as “middle of the road” is where researchers fall on both objectivist and subjectivist beliefs in a single research (Kaushik & Walsh, 2019). This research follows this latest trend.

6.2.3 Epistemology

Epistemology refers to the study of knowledge and understanding, focusing on the nature, sources, limitations, and validity of knowledge. It addresses how we know what we know and the justification of that knowledge (Moon et al., 2016; Creswell & Creswell, 2017; Kaushik & Walsh, 2019). Like ontology, epistemology in research influences the choice of methodology, the design of the study, and the interpretation of results, guiding researchers on how to acquire knowledge about the world (Moon et al., 2016; Creswell & Creswell, 2017; Kaushik & Walsh, 2019).

Epistemological considerations determine the relationship between the researcher and the subject of study, the types of questions asked, and the methods used to seek answers (Moon et al., 2016; Creswell & Creswell, 2017; Kaushik & Walsh, 2019). For example, a positivist epistemology assumes that there is a single objective reality that can be understood through observation and rational analysis, often leading researchers to use quantitative methods to test hypotheses and measure variables (Moon et al., 2016; Creswell & Creswell, 2017; Kaushik & Walsh, 2019). Conversely, an interpretivist epistemology posits that reality is subjective, constructed by individuals' experiences and perceptions, which leads researchers to adopt qualitative methods to explore meanings, contexts, and the complexity of human behavior (Moon et al., 2016; Creswell & Creswell, 2017; Kaushik & Walsh, 2019). The study was guided by a mixture of these two epistemological positions to elicit responses from respondents. This position is in tandem with the adopted ontological position.

6.2.4 The chosen paradigm

Having decided to adopt a mix of both objectivist and subjectivist ontological positions as well as both positivist and interpretivist epistemological positions means a pragmatist paradigm underlies this research. Pragmatism is a kind of “middle-of-the-road” paradigm that has emerged in recent times which allows researchers to fall on both objectivist and subjectivist philosophies in single research (Kaushik & Walsh, 2019). In other words, pragmatism bridges the gap between positivism and interpretivism (Creswell & Creswell, 2017). A major position of pragmatism is that knowledge should be based on both facts as well as beliefs and habits that are socially constructed (Kaushik & Walsh, 2019). The choice of pragmatism for this study is influenced primarily by the fact that it fits well within social intervention research which is linked to the pursuit of social justice (Kaushik & Walsh, 2019). The fact is the PFJ program is a social intervention intended to achieve social justice by improving the socio-economic conditions of small-scale rural farmers and their families (MoFA, 2017).

6.3 Research design and its justification

Research design is the overall strategy that a researcher chooses to integrate the different components of the study in terms of data collection and analysis hence serves as the blueprint of the study (Creswell & Creswell, 2017). The design is dictated by the philosophical assumptions and the research problem being addressed (Creswell & Creswell, 2017). Since the philosophy is pragmatism, to effectively address the research questions, the research adopted a mixed-method design (Kaushik & Walsh, 2019; Brierley, 2017). The mixed methods research design is regarded as the third methodological movement after quantitative and qualitative research designs (Brierley, 2017). Adopting the mixed-method design is advantageous because it overcomes the disadvantages that are inherent in monomethod research by adding breadth and depth and providing a more complete picture of the research (Brierley, 2017:5). Furthermore, it

is designed to be exploratory, descriptive, and cross-sectional in nature. It is descriptive due to the nature of the research questions investigated some of which require small-scale farmers to describe their experiences and views (Creswell & Creswell, 2017) about the program's contribution to their market access. It is exploratory because not much is known about the success or otherwise of the PFJ because since its inception, no short-term evaluation has yet taken place (MoFA, 2017). Lastly, it is cross-sectional because it is being conducted at a point in time (Brierley, 2017:5).

6.4 Research approach and its justification

The research approach for this study is primarily characterized by its pragmatic stance. This approach combines elements of both objectivist and subjectivist ontological positions, as well as positivist and interpretivist epistemological positions (Yardley, & Bishop, 2017). Pragmatism, as the underlying philosophy, acknowledges the importance of embracing diverse perspectives to comprehensively address the research problem (Veen et al. 2021). This pragmatic approach allows for flexibility in research methods and acknowledges that the research problem at hand, which is the evaluation of the Planting for Food and Jobs (PFJ) program's impact on small-scale farmers' market access, may benefit from different viewpoints. It aims to bridge the gap between traditionally opposing philosophical stances, providing a more holistic understanding of the research topic.

By adopting a pragmatic research approach, the study aims to synthesize the PFJ program's impact, recognizing that it involves various dimensions and subjective experiences. This approach encourages a dynamic and adaptable research process that can accommodate different research methods and analytical tools as required. The research approach in this study is characterized by its open-mindedness and readiness to integrate multiple perspectives for a more comprehensive understanding.

6.5 Research method and its justification

Mixed methods were employed in this study. As the mixed methods research involves analysis of both quantitative and qualitative data, multiple data analysis methods for the study giving its multidimensional nature. Specifically, both numeric (statistical) and non-numeric techniques was employed in the data analysis. In the qualitative analysis, various transcripts was typed and loaded into NVivo software which allowed for classification of the interviews into themes and sub-themes (Plant, 2015). The researcher classified all the transcripts according to the desired themes and the responses of the participants (Plant, 2015). In the quantitative analysis the questionnaires was checked, coded, rechecked, and entered into the Statistical Package for Service Solution (SPSS) version 20. This statistical software (SPSS) and Stata permits the researcher to use descriptive techniques such as multivariate probit (MVP) regression in performing quantitative analysis (Plant, 2015).

6.6 Target population and sampling

This section provides an overview of the target population and sample size considerations for the research. It emphasizes on the selection of small-scale farmers in the PFJ program in the Ho West District, Volta Region, Ghana. The sample size consists of 500 farmers for quantitative analysis and 25 to 50 farmers for qualitative interviews.

6.6.1 Target population

The target population is all small-scale farmers under the PFJ program who have been farming for 10 years and above in the Ho West District area in the Volta Region of Ghana. The choice of the Volta Region is deliberate. According to Ansah et al. (2020), Ghana achieved the Millennium Development Goal One target of halving poverty and

malnutrition by the end of 2015. However, quoting Cooke, Hague, and McKay (2016), these researchers indicate that over a quarter of the Ghanaian population still lives below the poverty line of US\$ 1.25/day, with the Volta Region being one of the most affected. The Ho West District area in the Volta Region is selected due to its rural nature, high density of small-scale farmers and accessibility by road for data collection purposes. The estimated number of small-scale farmers is 17,559 (MoFA, 2017).

6.6.2 Sample size

Using the freely available on-line sample size calculator called *Makor*, yielded a minimum sample size of 355 respondents for the quantitative part of the study. However, the decision was made to randomly select 500 farmers to compensate for any possible non-responses as recommended by Creswell and Creswell (2015) and Brierley (2017). For the qualitative part, the decision was made to interview between 25 to 50 farmers who may or may not have been included in the 500 sample of farmers. These interviewees were purposely selected based on their willingness to undergo interviews and their availability bearing in mind that farmers are usually busy most of the time.

6.6.3 Sampling technique and procedure

A multistage sampling technique was used in this study. The first stage involved purposively selecting the volta region of Ghana since the region has most of it populace living below the poverty line of US\$ 1.25/day (Cooke, Hague, and McKay, 2016). Given that the study focuses on smallholder farmers, the purposive sampling techniques was further employed in the second stage to select the Ho West District area. The Ho West District area in the Volta Region is selected due to its rural nature, high density of small-scale farmers and accessibility by road for data collection purposes. The sampling frame was then obtained from MoFA. Subsequently, at the third and last stage, the 500

smallholder farmers were selected from the district by using the systematic sampling technique. This was done by using the sampling frame in Microsoft excel.

6.7 Data collection

In the next sections, detailed explanation is made on the data collection instrument and the method that was employed to collect the data. The choice of data collection instrument, whether it be surveys, interviews, observations, or other tools, significantly influences the nature and quality of the data obtained. Equally important is the procedure used, which outlines the steps and techniques applied to ensure systematic and accurate data collection.

6.7.1 Data collection instruments

Structured questionnaires and semi-structured interviews were utilized for collecting the data. Structured questionnaires involved the use of specific, uniform questions that were answered in the same way by all farmers involved in the study, while in semi-structured interview guides, questions were asked, allowing participants to share their thoughts in their own words. These methods were utilized to ensure that data was comprehensively and reliably gathered from the smallholder farmers.

6.7.2 Data collection procedure

According to Brierley (2017:3), “the mixed methods research involves the collection and analysis of both quantitative and qualitative data. Therefore, in this research is both quantitative and qualitative data was collected. There were two methods employed for data collection. These methods are the use of structured questionnaires for collecting numeric data and in-depth interviews or focus group discussions. The in-depth interviews

were conducted using interview guides. These questionnaire and interview guides were self-constructed under the guidance of the research supervisor. The researcher employed two research assistants (agriculture extension officers) at the facility (District Assembly) for data collection.

6.8 Validity and reliability assurance

Validity and reliability issues differ for quantitative and qualitative research hence steps to ensure their assurance differ (Creswell & Creswell, 2017; Smith & Noble, 2014). In a qualitative study, validity refers to the integrity and application of the methods undertaken and the precision in which the findings accurately reflect the data (Creswell & Creswell, 2017; Smith & Noble, 2014). To ensure validity in the qualitative part, the following steps, or guidelines of Smith and Noble (2014) were employed. Truth-value was assured by (i) recognising that multiple realities exist; (ii) the researcher outlined personal experiences and viewpoints that may have resulted in methodological bias; (iii) clearly and accurately present participants' perspectives (Smith & Noble, 2014). Literature highlights content validity and construct validity as the main issues in quantitative research (Brierley, 2017; Creswell & Creswell, 2017; Smith & Noble, 2014). Content validity is the extent to which a research instrument accurately measures all aspects of a construct (Creswell & Creswell, 2017). To ensure content validity of the study, expert opinion and guidance of the supervisor would be sort in the development of the research instruments (Creswell & Creswell, 2017). Thereafter, the questionnaire would be pre-tested. Construct validity on the other hand is the extent to which a research instrument measures the intended construct (Creswell & Creswell, 2017). One way to ensure construct validity is to operationally define the variables to be measured (Creswell & Creswell, 2017). Therefore, all variables in this research were operationally defined. Concerning reliability assurance, in a quantitative study, reliability describes consistency within the employed analytical procedures or the consistency among responses of multiple users of an instrument (Smith

& Noble, 2014). To ensure consistency in the quantitative part of the study, care was taken to ensure that the questions were unambiguous and written in simple to understand language and the questions were structured and standardized so that questions and instructions are straight forward and free of ambiguities. Although there are a range of industry standards that should be adhered to ensure that qualitative research provides reliable results, the most used criteria are dependability and transferability (Creswell & Creswell, 2017; Smith & Noble, 2014). Transferability is the extent to which the findings of one study can be applied to other situations while for dependability, the research processes must be reported in detail to enable future researchers to repeat the work (Creswell & Creswell, 2017). Therefore, the qualitative part of this study was described and discussed in detail.

6.9 Ethical approaches

Firstly, this research was undertaken in line with the Research Ethics and Integrity Policy Framework of the Central University of Technology, Free State, South Africa. This policy is aligned with acceptable international norms and standards for conducting research. Ethical issues are therefore of paramount interest and importance to the researcher before, during and after the research period. Furthermore, strict confidentiality was ensured by treating any information from respondents as private and for this study only. Anonymity was assured using pseudonyms or codes to identify participants so that no personnel identified would be available to link participants to the information they provide. All participants were provided with all information related to the study to ensure informed consent. Also, no one was forced to take part and participants were allowed to withdraw from the research at any time they wish to do so.

6.10 Data analysis

This section details the methods employed for the analysis of each subsidiary objective. The methods were selected carefully to ensure that data collection and analysis follow the principles of scientific research. The methods have been chosen based on a thoughtful consideration of the specific research questions and objectives, with a particular emphasis on current literature. It is aimed to provide a robust and comprehensive understanding of each subsidiary objective and collectively address the main objective.

6.10.1 Constraint analysis (Kendall's W)

There are many statistical tools for ranking items such as challenges. They include; the Garrets ranking technique, Friedman's test and then the Spearman's Correlation Rank (Upadhyay et al., 2021). However, Kendall's Coefficient of Concordance (W^a) is mostly preferred since it goes further to tell the researcher the level of agreement among the respondents in ranking the items under study (Gearhart et al., 2013). Hence, the Kendall's Coefficient of Concordance (W^a) was employed to rank the challenges faced by farmers in the PFJ program (Diise et al., 2018). The Kendall's W was derived from the expression,

$$W = \frac{12(\sum D^2)}{m^2(N)(N^2-1)} \quad [1]$$

$$\text{where } D = R - A \quad [2]$$

N= total number of challenges being ranked

m= sample size=400

R= sum of ranks given to a particular challenge

$$A = \frac{\sum R}{n} \quad [3]$$

6.10.2 Multivariate probit model

The Multivariate Probit Model (MVP) was applied to examine the drivers of market access and market linkage of the PFJ program. Market access was broken down into categories: market information service; transportation and logistics support; aggregation and farmers' organization; market days in the community; and availability of processing centers. Similar categories was also applied the market linkage. Hence, empirical specification of the factors influencing market access and market linkage can be modelled in two ways, by either multinomial or multivariate regression analysis (Greene 2003). However, the categories of market access and market linkage are not mutually exclusive and therefore the random error components of the equations may be correlated. Therefore, it is advisable to consider using a multivariate model.

Several studies (Gillespie, Davis, & Rahelizatovo, 2004; Jenkins et al. 2011; Mittal & Mehar, 2016) have used multivariate probit estimation in agricultural studies on the basis that the multivariate probit framework allows for increased efficiency in estimation. Based on the above, the influence of a set of factors on market access and market linkage was assessed using a multivariate probit model (MVP). The MVP model was first estimated for a set of (five) dimensions of market access. and then another estimated for a set of market linkage dimensions. The multivariate probit model is described below.

$$Y_{ij} = X_{ij}\beta_j + \mu_{ij} \quad [4]$$

Where, Y_{ij} ($j=1, \dots, n$) denotes market access categories. Here, $n=5$, i.e., dimension of market access by the i th smallholder farmer ($i=1, \dots, n$, here; n = the number of respondents, 400), X_{ij} is a vector of the observed variable that affects the farmers' access to market, β_j is a vector of unobserved parameters which are to be estimated and μ_{ij} is unknown error term. Under this situation, each Y_j is a binary variable, hence equation [4]

is a system of n equations ($n=5$) to be estimated (Ullah & Shivakoti 2014). The five equations are as follows:

$$Y_1^* = a_1 + X\beta_1 + \mu_i \quad [5]$$

$$Y_2^* = a_2 + X\beta_2 + \mu_2 \quad [6]$$

$$Y_3^* = a_3 + X\beta_3 + \mu_3 \quad [7]$$

$$Y_4^* = a_4 + X\beta_4 + \mu_4 \quad [8]$$

$$Y_5^* = a_5 + X\beta_5 + \mu_5 \quad [9]$$

Where Y_1^* , Y_2^* , Y_3^* , Y_4^* and Y_5^* are latent variables underlying each of the dimension of market access/ linkage that $Y_j = 1$ if $Y_j^* > 0$; otherwise, 0. The hypothesis can be tested by running five different independent binary probit or logit models by assuming that error terms are mutually exclusive. However, different dimensions of market access/ linkage may be correlated, thus the elements of error terms might experience stochastic dependence. In this situation, a multivariate probit model (MVP) is most appropriate. The set of explanatory variables used in the multivariate probit regression model are presented in table 6.1

Table 6.1: Explanatory variables used in the multivariate probit regression model

VARIABLE	MEASUREMENT
Gender	0=Female; 1=Male
Age	Years
Marital Status	1=Married; 0=single
Educational Status	1=Formal Education; 0=No formal education
Years of Schooling	Years
Years of farming	Years
Annual Income Sales GHS	GHS
Receive any credit for farming	1=Receives credit; 0=Otherwise
Amount of credit received	GHS
Source of credit	1=Formal source; 0=Otherwise

Belong to any FBO	1=Yes; 0=otherwise
Years of participating in FBO	Years
Engagement in any part of activity apart from farming	1=Yes; 0=otherwise
Participating in PFJ	1=Yes; 0=otherwise
Cultivating more than one of the specified crops under PFJ	1=Yes; 0=otherwise

6.10.3 Impact assessment (PSM)

The study employed propensity score matching (Hagos et al., 2011) to estimate how participation in the PFJ program impacted farmers' economic performance. Matching econometrics emerged as a promising approach for resolving the issue of identifying comparable treated and control groups, as indicated by Ravallion (2003). Hagos et al. (2011) also highlighted that matching is a widely used technique for estimating the average treatment effects of a binary treatment on a continuous scalar outcome, utilizing a non-parametric regression procedure to establish a counterfactual based on the assumption of selection based on observable characteristics. In this research, participation in the PFJ program is treated as a binary intervention, with economic performance as the outcome variables. The treatment group consists of smallholder farmers who participated in the PFJ program, while the control group comprises non-participants. Consistent with established program evaluation literature, let Y_1 represent the outcome variable when a farmer, denoted as i , is subjected to treatment ($C=1$), and let Y_0 denote the economic performance when the same farmer i is placed in the control group ($C=0$). Thus, the observed outcome can be defined as follows.

$$Y = CY_1 + (1 - C)Y_0 \quad (10)$$

Y_1 is observed when $C=1$; and Y_0 is observed when $C=0$. The average effect of treatment of (PFJ programme) on the treated is to be identified and it is defined as:

$$ATT = E(Y_1 - Y_0|C = 1) = E(Y_1|C = 1) - E(Y_0|C = 1) \quad (11)$$

It is important to note that, $(Y_1|C = 1)$, $E(Y_0|C = 1)$ is unobservable. Hence a counterfactual $E(Y_0|C = 1)$ is created by matching the treatment and the control farmers based on observable characteristics. For the matching to be valid, Conditional Independence Assumption (CIA) was the primary imposed in matching the estimators. Conditional Independence Assumption states that the decision to adopt is random conditional on observed covariates X ;

$$(Y_1, Y_0) \perp C|X \quad (12)$$

The assumption implies that the counterfactual outcome in the treated group is the same as the observed outcomes for control group;

$$E(Y_0|X, C = 1) = E(Y_0|X, C = 0) = E(Y_0|X) \quad (13)$$

The assumption rules out of the selection into the programme based on unobservable gains from participating. The average treatment effect, ATT can be computed under the CIA as follows:

$$ATT = E(Y_1 - Y_0|X, C = 1) = E(Y_1|X, C = 1) - E(Y_0|C = 1) \quad (14)$$

In 1983, Rosenbaum and Rubin introduced the concept of matching along $P(X)$, a single index variable, also known as the propensity score, which summarizes covariates. This approach is employed to address the challenges associated with matching farmers based on a multitude of covariates, thereby overcoming the curse of dimensionality when there are too many dimensions to consider. The propensity score, often referred to as the response probability, represents the conditional probability that farmer i will participate in the PFJ program given their covariate values.

$$p(X) = pr(C = 1)|X \quad (15)$$

Equation 16 can then be written as:

$$ATT = E(Y_1|P(X), C = 1) - E(Y_0|P(X), C = 1) \quad (16)$$

The propensity score was estimated by a binary probit regression model.

6.11 Chapter summary

The research methodology employed in this study offers a structured framework for addressing the impact of the Planting for Food and Jobs (PFJ) program on the economic performance of smallholder farmers through support services, market access and market linkages for small-scale farmers in the Volta Region of Ghana. Research paradigms play an important role in shaping the study's ontological and epistemological foundations. This research integrates contrasting perspectives, adopting a pragmatic approach that combines elements of both objectivism and subjectivism in ontology and positivism and interpretivism in epistemology. The research design chosen is mixed-method, encompassing quantitative and qualitative components. This approach ensures the study's breadth and depth, providing a comprehensive perspective on the research questions. It is exploratory due to the program's limited prior evaluation, descriptive as it involves small-scale farmers describing their experiences, and cross-sectional as it is conducted at a specific point in time. A pragmatic research approach guides this study, promoting flexibility in research methods and the integration of diverse viewpoints. This open-minded approach acknowledges the multifaceted nature of the research problem and encourages adaptability in the research process. Structured questionnaires and in-depth interviews serve as data collection instruments, allowing for comprehensive and reliable data gathering. To ensure data validity and reliability, the study adheres to content and construct validity in quantitative research and dependability and transferability in

qualitative research. Ethical considerations are of utmost importance, and the research aligns with the research ethics and integrity policy framework. Strict confidentiality, informed consent, and participant withdrawal rights are ensured. The study employs data analysis techniques such as Kendall's W for constraint analysis and Propensity Score Matching (PSM) for impact assessment. These methods enable the exploration of the challenges faced by farmers and the evaluation of the PFJ program's economic impact. The multivariate probit model (MVP) was used to estimate the factors influencing smallholder farmers market access and market linkage. Lastly, qualitative techniques used include thematic analysis.

CHAPTER 7: RESULTS AND DISCUSSION

7.1 Introduction

This chapter presents the results and discussions on the demographic characteristics, the qualitative analysis, multivariate probit estimates of the factors influencing rural small-scale farmers' market access under the PFJ programme, multivariate probit estimates of the factors influencing rural small-scale farmers' marketing linkages under the PFJ programme, constraints of market access and marketing linkages of farmers and the impact of market access and marketing linkages on the economic performance.

7.2 Demographic background of the farmers

The socioeconomic characteristics of the farmers as presented in Tables 7.1 and 7.2 shows that, out of the 400 respondents surveyed, 177 (44.25%) were male, and 223 (55.75%) were female. This suggests that a larger proportion of the respondents in the study area are female farmers. Globally, women have been found to play a significant role in agriculture, especially in developing countries (Patil and Babus, 2018; Giroud and Huaman, 2019). In sub-Saharan Africa, for instance, women contribute to approximately 60-80% of agricultural labor (O Agada & Ajani, 2014; Palacios-Lopez et al., 2017). Research has shown that incorporating gender-sensitive approaches in agricultural programs can lead to improved outcomes and increased benefits for both male and female farmers. Therefore, implementing a gender-responsive approach in the PFJ program could contribute to reducing gender disparities and promoting more equitable access to resources and benefits from agricultural development initiatives (Akalbila et al., 2020).

Table 7.1: Socioeconomic characteristics of the farmers

Categorical variables	Frequency	Percent (%)
Gender		
Male	177	44.25
Female	223	55.75
Marital Status		
Single	79	19.75
Married	241	60.75
Divorced	9	2.25
Widowed	71	17.75
Level of Education		
No Formal Education	179	44.75
Primary	127	31.75
JHS	63	15.75
SHS	22	5.50
Tertiary	9	2.25
Religion		
Muslim	286	71.50
Christian	108	27
Traditional	6	1.50
Credit Access		
Yes	187	46.75
No	213	53.25
Off Farm income		
Yes	246	61.50
No	154	38.50
Did you participate in the PFJ?		
Yes	164	41
No	236	59

Table 6.2: Summary of continuous variable

Variable	Mean	Std. Dev.	Minimum	Maximum
Age	38.365	12.934	16	17
Years of Farming	13.34	3.088	6	16
Credit received	574.075	237.009	150	2000
Years of schooling	4.145	4.785	0	20

60.75% of the respondents were married. implying that a larger proportion of married persons are involved in the PFJ. This is consistent with Abdallah et al. (2021) who found similar results. Married farmers have been found to have superior access to basic resources. Marriage often facilitates easier access to finance, land, and other economic resources in many countries (Ogato et al., 2009). In terms of education, a significant portion of the respondents, comprising 44.75%, had no formal education. A smaller proportion had higher levels of education, with 5.50% having completed Senior High School (SHS) and 2.25% having attained tertiary education. Higher levels of education have been found to be positively correlated with the adoption of modern farming practices and technologies. Studies, such as the one conducted by O'Donoghue and Heanue (2000), have found that farmers with better education are more inclined to embrace improved agricultural techniques, leading to higher yields. Education plays a crucial role in providing small-scale farmers with access to valuable information and knowledge, which can significantly enhance their agricultural practices and decision-making abilities (Misaki et al., 2018). A significant portion of the participants, accounting for 61.50%, reported engaging in activities other than farming, indicating a diversification of income sources. Among the respondents, 41% participated in the Planting for Food and Jobs (PFJ) program, while 59% did not. The PFJ program aims to enhance agricultural productivity by providing subsidized inputs like seeds and fertilizers to small-scale farmers (Agyemang et al., 2022). Participating in the PFJ program has been linked to increased

yields and improved productivity for farmers (Luther et al., 2018). It can also improve market access for small-scale farmers, enabling them to sell surplus produce and generate income (Adu, 2018). Additionally, 46.75% of the participants belonged to Non-Governmental Organizations (NGOs), while 53.25% did not. Being part of an NGO can offer substantial benefits for small-scale farmers, including access to support services, resources, and opportunities (Gualandris and Klassen, 2018). NGOs often provide agricultural extension services, offering technical expertise, training, and knowledge dissemination to farmers (Ragasa et al., 2016). Being part of an NGO-supported farmer group can enhance market access and bargaining power within agricultural value chains. Moreover, NGOs can facilitate access to agricultural inputs, credit, and other financial services, empowering farmers to invest in their farming activities and increase productivity (Bingen et al., 2003). Regarding credit access, 57.25% of the participants had access to credit, while 42.75% did not. Access to credit is crucial for small-scale farmers as it significantly impacts their ability to invest in inputs, expand their farming activities, and improve productivity. Research has demonstrated that access to credit allows small-scale farmers to invest in inputs like seeds, fertilizers, and machinery, leading to increased agricultural productivity. The average age of the participants was around 38 years, with a standard deviation of 12.93, indicating that the majority of the small-scale farmers in the study area are young adults. Young adult farmers tend to be more receptive to new agricultural technologies and innovations as they are open to change and have grown up with modern technology. On average, the participants had approximately 13.34 years of farming experience. Farmers with more years of experience often possess valuable knowledge and expertise in traditional agricultural practices specific to their local conditions. This experience equips them to make informed decisions, manage risks, and respond to uncertainties in agriculture (Kahan, 2018).

7.3 Support services and market access due to the PFJ programme

The results here are the major support services and market improvements available under the PFJ initiative, based on feedback from participants within the farming community. Here, qualitative approach was mainly employed.

7.3.1 Availability of support services to promote market access

This section presents the results of the various support services and market improvements available to these farmers in the community. Drawing from the experiences and insights of different participants, this section shed light on the pathways that can enhance market access for smallholder farmers. Smallholder farmers go through a lot in their quest to access to market for their produce. The following qualitative results highlight the main support services available for promoting market access smallholder farmers in this community/district.

Participant 1 emphasized the importance of Market Information service: *"Market Information Services provide us with real-time and accurate data about market trends, prices, consumer preferences, and demand. This knowledge empowers us to make informed decisions regarding crop selection, timing of harvest, and pricing strategies. With this we align our production with market demand, avoiding overproduction or underproduction. With a clear understanding of market dynamics, we can optimize their supply to match consumer needs, ultimately leading to better market access and improved profitability."* (Male administrator, aged 27). Similar research by Chen and Tang, (2015) also support the fact that, market information can help farmers to make better (long-term) production planning decisions (or agricultural advice that can help farmers to improve product quality, reduce production cost, and enhance process yield.

Transformation and logistics support was also recognized by Participant 1: *"Efficient logistics systems ensure that our produce reaches markets in a timely and cost-effective manner. Proper handling and packaging maintain product quality, reducing post-harvest losses and increasing the chances of accessing distant markets."* This finding is consistent with to the work of Kovács, and Kot, (2016), in which they stated that logistics systems help deliver produce to markets quickly and affordably while handling and packaging help maintain product quality, reduce post-harvest losses, and improve access to diverse markets channels.

Aggregation and farmer's organization, as stated by Participant 3: *"Farmers' organizations facilitate this process by bringing us together, enabling us to collectively market their products. Aggregation increases the volume of produce, making it more attractive to larger buyers like retailers, processors, or exporters. This collective approach enhances our bargaining power, improves our negotiating position, and allows us to access markets that might have been challenging to enter individually."* This finding is in agreement with Awudu (2018), which revealed that Farmer-based organizations support farmers by providing access to essential resources such as tractors, land, fertilizers, seeds, markets, and transportation services, enhance bargaining power as well as access to free extension services from government agencies and non-governmental organizations to promote commercial agriculture.

Participant 3 highlighted the significance of market days in the community to the promotion of market access: *"Community markets days create a direct connection between us the farmers and the local consumers. These events provide us with the platform to showcase our products, engage with buyers and receive immediate feedback."* This outcome agrees with Boakye et al., (2016), who argued that weekly market days are essential in rural African areas as they promote economic activities, social cohesion, access to goods and services, income generation, and market information dissemination.

Participant 3 acknowledged the Availability of Processing Centers: *"Processing centers allow we the farmers to add value to our raw produce by processing, packaging, and transforming it into higher value products. When we process the produce, we're able to tap into other market segments and this also help to keep the produce for a long time."*(Female administrator, aged, 37). This response agrees with previous findings (Afful-Koomson & Fonta, 2015; Darfour & Rosentrater., 2016; Adeyeye, 2017) which indicate that Agricultural Processing Centers are essential for adding value to agricultural products, preserving perishable goods, improving quality, expanding market access, creating employment opportunities, promoting diversification, and facilitating technology adoption in the agricultural sector.

Main market improvements activities available for promoting market access by smallholder farmers in this community/district.

Participant 5 emphasized the importance of Aggregation Centers to the marketing of their produce: *" By bringing our produce together, we achieve economies of scale, attract larger buyers, negotiate better prices, and access markets that might have been difficult to reach individually. Aggregation centers also help standardize product quality and packaging, meeting the requirements of larger buyers and more demanding markets."* This agrees with Dzanku, Osei, and Osei-Akoto (2021), which reveals that Aggregating Centers play a crucial role in providing market access, achieving economies of scale, ensuring quality assurance, facilitating price discovery, mitigating risks, promoting technology adoption, offering capacity building, and linking farmers with financial institutions in the agricultural value chain.

Farmer Field Day and Trade Fair, Participant 5 mentioned farmer field day and trade fair: *" Farmer field days and trade fairs provide platforms for us to showcase our produce and interact directly with consumers, retailers, processors, and other stakeholders. These events enable us to build relationships, receive feedback, and gain exposure to different*

market segments. Participating in trade fairs allows us to present our produce in an attractive and competitive manner, potentially leading to increased sales and market expansion."(Male administrator aged 36). In support of this findings Suvedi and Kaplowitz (2016) found that Farmer Field Days provide a platform for demonstrating new technologies and sustainable practices, allowing farmers to learn from each other through peer-to-peer engagement. Similarly, Kansime et al. (2019) showed that participating in Field Days and Trade Fairs enabled Ugandan smallholder farmers to access quality inputs, new production techniques, mechanization services, as well as connect with viable markets. Agricultural Farmer Field Days and Trade Fairs therefore play a vital role in knowledge sharing, capacity building, technology adoption, market access, networking opportunities, promotion of sustainable practices, policy advocacy, and community building in the agricultural sector.

Participant 5 highlighted farmer training on market requirements: "*Training we receive on market requirements helps us understand the quality standards, certifications, and regulations necessary to access specific markets. When we produce goods that meet these requirements, we can access higher-value markets, including export markets. Training also helps us adopt best practices in packaging, labelling, and post-harvest handling, ensuring that our products maintain quality and freshness during transportation and storage.*"

Participant 6 discussed the access to financial services: "*Access to financial services, such as credit and loans, enables us to invest in our operations, improve our productivity, and seize market opportunities. Financial support can fund the purchase of better seeds, modern equipment, and technologies that enhance production and product quality.*" The positive relationship found between access to credit and market access supports previous findings in the literature. Abdallah, Ayamga, and Awuni (2019) conducted research in Northern Ghana and found that participation in microcredit programs increased smallholder farmers' probability of participating in output markets to sell their produce.

Increased access to credit enabled farmers to invest in improved seeds, fertilizers, equipment, transportation, and other things needed to increase productivity. It also helped them meet quality standards and certifications to sell to new markets. Similarly, Ankrah Twumasi et al. (2020) found that access to loans and savings in rural Ghana allowed farmers to purchase farm inputs like insecticides, pay labor costs for production, and transport goods to markets. This increased their marketed surplus and participation in output markets. Nordjo and Adjasi (2020) also showed that credit access expanded market participation for crop farmers Ghana. The resources from loans enabled acquisition of modern inputs and expansion of farm size and output. The positive impacts found across these studies stem from the vital roles that access to credit plays. Credit enables greater productivity and profitability, helps in managing risks, expands market opportunities by enabling farmers to meet buyer requirements, fosters innovation of new products/processes, supports value chain development through vertical coordination, financially empowers farmers, and alleviates poverty. Thus, multiple studies in the literature reinforce that access to credit is an important factor facilitating market access and commercialization for smallholder farmers.

The insights provided by these farmers, paint a hopeful picture of the future. With continued focus on these support services and market improvements, the journey of a smallholder farmer's produce from the farm to the market can become smoother, ensuring that their dedication and labour bear the fruits of success.

7.3.2: Market access

To understand the needs for improved market access among farmers, the study gathered views from the community. A notable result from this research was the significant role of Information Services.

Participant 7 recognized the importance of Information Services: *"Information services provide us with crucial insights into market trends, pricing, consumer preferences, and demand. You see, my brother in every business if you have information, it gives you the upper hands. For our case information service really help us to get accurate and up-to-date information can make informed decisions about what crops to grow, when to harvest, and how to package and market their products."*(Male administrator 40 years). This finding confirms with Fabregas, Kremer and Schilbach, (2019) who revealed access to this real-time transparent data helped farmers better negotiate with traders, identify the most profitable markets to sell their crops, and make informed production decision. Attah et al. (2020) also demonstrate that equipping farmers with relevant, timely and actionable market information, whether on prices, supply/demand dynamics or consumer preferences, serves as an important determinant of better decision-making regarding production systems, technologies used, crops grown, where and when to sell produce, bargaining power, and more. Access to market data aids in strategy development, risk mitigation and seizing emerging income opportunities for agricultural commercialization. The feedback from the participants, especially experienced individuals like Participant 7, highlighted the importance of Information Services in guiding farmers' decisions. The study indicates that incorporating thorough information platforms is crucial for the effectiveness of the PFJ programme.

7.4 Drivers of market access and marketing linkage

The key factors influencing the market access and marketing linkages for small-scale farmers have been analysed assessed. This comprehensive evaluation was carried out with distinct attention to each aspect (market access and marketing linkages), ensuring a thorough understanding of the dynamics involved. The following sections presents a detailed account of the findings, shedding light on the key drivers that shape the market market access and marketing linkages for these farmers.

7.4.1 Factors influencing market access

Factors influencing rural small-scale farmers' market access under the PFJ programme was analyzed using the Multivariate Probit Model and the results are presented in Table 7.3. The key depend variables are market information service, transportation and logistics support, aggregation and farmers' organization, market days in the community and availability of processing centres by the independent variables, gender, age, religion, marital status, educational status, years of schooling, years of farming, annual income sales GHS, received any credit for farming, amount of credit received, source of credit, belong to any FBO, years of participating in an FBO, engagement in any other activities apart from farming, participating in PFJ and cultivating more than one of the specified crops under PFJ. The likelihood ratio chi-square of 127.81 with a $P = 0.0005$ value tells us that our model as a whole is statistically significant.

Age demonstrates statistical significance (with a p-value below 0.05) in relation to market information services and the availability of processing centers. This suggests that age could exert a substantial impact on these two aspects. Essentially, as individuals grow older, their involvement with market information services is likely to increase (Bezu & Barrett, 2012). Nevertheless, the negative coefficient linked to processing center availability implies that as age advances, the accessibility of processing centers tends to decline. Age was predicted to have a favorable impact on output market access, in line with Margaret et al. (2015). They claimed in their research that more experienced and older farmers are better able to choose which crops to grow and have more contacts, which makes it possible to find trade possibilities at a lesser cost than less seasoned farmers.

In a similar vein, the coefficient associated with religion holds statistical significance (with a p-value below 0.05) concerning the frequency of market days within the community. This implies that religion might have a notable influence on how often market days are

held (Peterman, Behrman, & Quisumbing, 2014). A positive coefficient suggests that individuals adhering to a specific religion could be associated with a heightened frequency of market days in their community. However, the story is different when it comes to other areas. The coefficients of religion in relation to market information services, transportation and logistics support, farmers' aggregation, and organization, as well as the availability of processing centers, lack statistical significance.

The amount of credit the farmer received is statistically significant ($p\text{-value} < 0.05$) in relation to market information services and the organization of farmers' aggregation (Fafchamps & Minten, 2012). However, it lacks statistical significance when it comes to support in transportation and logistics, the frequency of community market days, and the availability of processing centers. Remarkably, the impact of market information services on the amount of credit farmers receive is characterized by a negative effect. In contrast, the involvement in farmers' aggregation and organization exhibits a notably positive influence on the extent of credit obtained by farmers (Sheahan & Barrett, 2017). In essence, the amount of credit that farmers secure holds importance in specific contexts.

The affiliation of farmers with any Farmer-Based Organization (FBO) lacks statistical significance (with a $p\text{-value}$ exceeding 0.05) in relation to utilizing market information services, participating in farmers' aggregation and organization efforts, and determining the frequency of community market days (Narayanan & Gerber, 2013). This suggests that being a part of an FBO might not exert a significant impact on these aspects. In other words, membership in a farmer-based organization may not significantly influence the use of market information services, farmers' aggregation and organization, or the frequency of market days within the community. However, the scenario shifts slightly when it comes to transportation and logistics support, as well as the availability of processing centers. The affiliation with any FBO displays marginal significance (with a $p\text{-value}$ below 0.10) in these areas. This implies that being a member of a farmer-based organization could moderately affect transportation and logistics support, as well as the

accessibility of processing centers. FBOs can play a vital role in disseminating timely and relevant market information to their members (Martey et al., 2014). According to their findings, farmers may have established networks and communication channels that enable them to collect and share information about market prices, demand trends, consumer preferences, and other market-related insights.

The length of time a member has been associated with a farmer-based organization (FBO) does not hold statistical significance (with a p-value surpassing 0.05) in terms of its impact on market information services, transportation and logistics support, farmers' aggregation, and organization, as well as the frequency of market days within the community. This indicates that the duration of FBO membership may not have a considerable effect on the utilization of market information services, transportation and logistics assistance, involvement in farmers' aggregation and organization endeavors, or the frequency of community market days. However, the situation differs when considering the availability of processing centers. In this context, the duration of FBO membership emerges as statistically significant (with a p-value below 0.05). This suggests that the extent of time an individual has been associated with an FBO might significantly influence the availability of processing centers. The positive coefficient associated with this relationship indicates that longer membership duration within an FBO is linked to an increased likelihood of accessing processing centers. Furthermore, engaging in activities beyond farming is statistically significant (with a p-value below 0.01) in relation to both market information services and the availability of processing centers (Barrett, Reardon, & Webb, 2001). This implies that participating in non-farming activities positively impacts the utilization of market information services and the availability of processing centers.

Table 7.3: Multivariate probit estimates- factors influencing market access

Variables	Market information service	Transportation and logistics support	Aggregation and farmers' organization	Market days in the community	Availability of processing centers
Gender	0.153 (0.243)	0.024 (0.186)	0.278 (0.244)	0.157 (0.220)	0.130 (0.246)
Age	0.017** (0.008)	0.001 (0.005)	-0.002 (0.007)	-0.007 (0.006)	-0.016 (0.006)
Religion	-0.279 (0.279)	0.073 (0.142)	0.278 (0.193)	0.318* (0.182)	-0.164 (0.186)
Marital Status	-0.187 (0.191)	0.083 (0.091)	-0.074 (0.116)	-0.002 (0.116)	0.173 (0.114)
Educational Status	0.363 (0.358)	-0.066 (0.243)	0.298 (0.266)	-0.103 (0.268)	0.127 (0.289)
Years of Schooling	-0.064 (0.074)	-0.015 (0.051)	-0.087 (0.056)	0.030 (0.056)	-0.043 (0.059)
Years of farming	0.003 (0.030)	-0.010 (0.022)	-0.010 (0.030)	-0.019 (0.026)	0.042 (0.028)
Annual Income Sales GHS	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Receive any credit for farming	-0.026 (0.183)	-0.130 (0.137)	-0.305* (0.186)	-0.227 (0.159)	0.230 (0.183)
Amount of credit received	-0.001** (0.000)	0.000* (0.000)	0.002*** (0.001)	-0.001* (0.000)	-0.000 (0.000)
Source of credit	0.371* (0.196)	0.006 (0.084)	-0.041 (0.108)	0.030 (0.105)	-0.047 (0.101)

Belong to any FBO	-0.558 (0.450)	-0.602* (0.352)	0.383 (0.495)	0.355 (0.407)	-1.212 (0.449)
Years of participating in FBO	-0.013 (0.040)	0.049* (0.030)	-0.051 (0.045)	-0.014 (0.035)	0.102 (0.040)
Engagement in any part of activity apart from farming	0.725*** (0.233)	-0.010 (0.167)	0.021 (0.216)	-0.264 (0.211)	-0.183 (0.226)
Participating in PFJ	0.030 (0.182)	0.089 (0.136)	-0.044 (0.186)	0.195 (0.159)	0.085 (0.177)
Cultivating more than one of the specified crops under PFJ	-0.083 (0.180)	0.140 (0.133)	0.039 (0.178)	-0.190 (0.158)	0.075 (0.175)
Constant	0.784 (0.571)	-0.475 (0.422)	0.400 (0.590)	1.697*** (0.505)	1.214 (0.542)

Likelihood ratio test of $\rho_{21} = \rho_{31} = \rho_{41} = \rho_{51} = \rho_{32} = \rho_{42} = \rho_{52} = \rho_{43} = \rho_{53} = \rho_{54} = 0$: $\chi^2(10) = 30.930$ Prob > $\chi^2 = 0.0006$.

*Note: *significant at 10%, **significant at 5%, and ***significant at 1%.*

7.4.2 Factors influencing marketing linkages under the PFJ programme

Factors influencing rural small-scale farmers' marketing linkages under the PFJ programme was analyzed using the Multivariate Probit Model. The results are given in Table 7.4. The key depend variables involved are aggregation centers, farmer field and trade fairs, farmer training on market requirements, market access and access to financial services. Key factors influencing marketing linkage include, age, religion, received any credit for farming, amount of credit received, source of credit, years of participating in FBO. The likelihood ratio chi-square of 125.90 with a $p= 0.0008$ value tells us that our model is statistically significant.

Age is not found to be statistically significant for aggregation centers, farmer field days and trade fairs, market access, and access to financial services. This suggests that age might not play a substantial role in influencing these aspects. However, the situation is different for farmer training on market requirements, where age is statistically significant (Bezu & Barrett, 2012). This implies that as age increases, the likelihood of participating in farmers trainings also increases. Hence, older farmers tend to be more likely to engage in farmer trainings that are related to enhancing farmers access to markets.

According to the information provided in the table, there is a noteworthy negative connection between aggregation centers and religion, and this connection is statistically significant (with a p-value less than 0.05) (Peterman, Behrman, & Quisumbing, 2014). Furthermore, the correlation between religion and access to financial services is positive and statistically significant (Peterman, Behrman, & Quisumbing, 2014).

The statistical analysis reveals that marital status plays a notable role in terms of market access, as indicated by its significant p-value (less than 0.05). However, it's important to note that marital status does not show any significant influence on other variables. Access to financial services holds significant importance for farmers' agricultural activities. The

findings presented in the table above suggest that there is a negative correlation between the number of years a farmer has spent in the profession and their access to financial services (Fafchamps & Minten, 2012). The extent of credit received by farmers plays a notably significant role in their agricultural endeavors (Sheahan & Barrett, 2017). Conversely, the amount of credit a farmer receives does not exhibit a statistically significant impact on other aspects.

Belonging to a Farmer-Based Organization (FBO) holds the promise of fostering improved livelihoods, heightened agricultural productivity, and stronger community development (Narayanan & Gerber, 2013). Moreover, the duration of time that farmers have been part of an FBO could play a significant role in determining their ability to access markets (Narayanan & Gerber, 2013). Participating in various income-generating activities beyond farming can contribute to the diversification of revenue streams across different periods, thereby aiding in the consistent management of cashflow throughout the year (Barrett, Reardon, & Webb, 2001).

Table 7.4: Multivariate probit estimates - factors influencing marketing linkages

Variables	Aggregation centres	Farmer field and trade fairs	Farmer training on market requirements	Market access	Access to financial service
Gender	0.068 (0.236)	0.047 (0.181)	-0.267 (0.258)	0.085 (0.274)	0.204 (0.212)
Age Years	0.010 (0.007)	0.002 (0.005)	0.014* (0.008)	-0.001 (0.007)	0.002 (0.006)
Religion	-0.403** (0.171)	0.078 (0.141)	-0.148 (0.178)	0.020 (0.213)	0.278 (0.167)
Marital Status	0.095 (0.129)	0.039 (0.094)	0.023 (0.116)	0.341*** (0.122)	0.100 (0.105)
Educational Status	0.195 (0.337)	-0.025 (0.236)	0.094 (0.250)	-0.364 (0.338)	-0.201 (0.246)
Years of Schooling	-0.044 (0.070)	-0.015 (0.050)	-0.035 (0.053)	0.071 (0.073)	0.002 (0.052)
Years of farming	0.017 (0.028)	-0.005 (0.022)	0.008 (0.029)	0.050 (0.031)	-0.059** (0.026)
Annual Income Sales GHS	0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)
Credit received	0.031 (0.176)	-0.103 (0.136)	-0.157 (0.187)	-0.227 (0.200)	0.048 (0.156)
Amount received	-0.001** (0.0001)	0.0001 (0.0001)	0.002*** (0.001)	-0.001** (0.0001)	0.0001 (0.0001)
Source of credit	0.088 (0.121)	0.031 (0.086)	-0.027 (0.108)	-0.135 (0.095)	-0.026 (0.094)

Do you belong to any FBO	-1.147*** (0.425)	-0.592 (0.351)	0.589 (0.484)	-1.830 (0.480)	-0.784 (0.393)
For how long have being part of FBO	0.037 (0.037)	0.047 (0.031)	-0.035 (0.0043)	0.178*** (0.045)	0.018** (0.035)
Engaging in any other activities apart from farming	0.763*** (0.219)	0.0001 (0.167)	-0.101 (0.219)	-0.078*** (0.249)	0.413** (0.188)
PFJ	0.000 (0.176)	0.051 (0.134)	-0.053 (0.186)	0.168 (0.198)	-0.079 (0.156)
Cultivating more than one specific crops under PFJ	-0.040 (0.172)	0.168 (0.133)	0.117 (0.179)	-0.213 (0.195)	-0.234 (0.153)
Constant	0.977 (0.537)	-0.559 (0.417)	-0.277 (0.600)	1.319** (0.589)	1.626*** (0.504)

*Likelihood ratio test of $\rho_{21} = \rho_{31} = \rho_{41} = \rho_{51} = \rho_{32} = \rho_{42} = \rho_{52} = \rho_{43} = \rho_{53} = \rho_{54} = 0$: $\chi^2(10) = 57.0375$ Prob > $\chi^2 = 0.0000$. Note: *significant at 10%, **significant at 5%, and ***significant at 1%*

7.5 Market access, marketing linkages and economic performance

Table 7.5 presents the impact of market access and marketing linkages on economic performance of the farmers using the propensity score matching. The results matched the performance of farmers having access to marketing linkages (Treatment) and the farmers having no access to market and marketing linkage (control group) based on the propensity score. The ATT which measures the effect of market access and marketing linkage on the economic performance was estimated using the Radius Matching-caliper and Kernel Matching.

Table 7.5: Market access, marketing linkages and economic performance

Method	Treatment	Control	ATT	T. Stat	%impact
RM	4.427	3.455	0.973	1.84*	28.2%
KM	4.427	3.200	1.227	2.30**	38.3%

The result in this table indicates that farmers having access to market and marketing linkages on economic performance by 0.973 using the RM was significant at 10%. Thus, using RM, farmers who did not have access to market and marketing linkages economic performances will be reduced by 0.973 if they have had access to market and marketing linkages. This suggests a positive impact of the improved market access and marketing linkages on economic performance. The KM revealed an increase of 1.227 in farmers economic performance. This also means that farmers who have access to market and marketing linkages could have increased by 1.227 in their economic performance as per the KM estimator. This is a larger effect than observed in the RM method, suggesting a potentially stronger impact of the market access and marketing linkages. All the results of the two matching algorithms show a significant difference in the farmers economic performance. The difference is therefore linked to the treatment variable which is farmers

having access to market and marketing linkages. The results then indicate that market access and marketing linkages have a significant effect on the farmers economic performance.

7.6 Key constraints to market access and marketing linkages

Small-scale rural farmers play a significant role, often encountering a myriad of challenges when accessing markets and establishing marketing linkages. The "Planting for Food and Jobs (PFJ) programme" was initiated to address these very issues. The results here unpacked the primary constraints faced by these farmers under the PFJ initiative. Beyond identifying these challenges, the potential solutions were also identified, shedding light on the avenues through which these obstacles can be surmounted. As we navigate through the findings, a holistic understanding of the prevailing market dynamics and the possible interventions will be explained. Both the quantitative and qualitative results on constraint analysis is presented.

7.6.1 Quantitative findings

In the process of farmers having access to markets and market linkages, they face a number of challenges. An attempt has been made to identify the various constraints faced by the farmers on market access and market linkages. The results have been tabulated in Table 7.6 below. This is mainly the quantitative results. The Kendall Coefficient of Concordance has been employed to assess the challenges and also measure the extent of agreement among the evaluators regarding the prioritization of the constraints or challenges outlined in the table.

Table 7.6: Constraints to market access and marketing linkages

MARKET ACCESS		MEAN RANK	RANK
Unavailability of a market in farming area		2.18	2 nd
High cost of transportation		2.67	3 rd
Poor road network		3.58	4 th
Lack of government support in complementary market services		2.15	1 st
High cost of hiring spaces in the market		4.42	5 th
MARKETING LINKAGE		MEAN RANK	RANK
Inability to access regional market		3.30	4 th
High cost of exportation (Shipping)		1.27	1 st
Unavailability of storage		3.13	2 nd
High cost of storage		2.31	3 rd
Test statistics			
Market Access		Market Linkage	
N	197	N	460
Kendall's W^a	0.385	Kendall's W^a	0.653
Chi-Square	303.535	Chi-Square	900.998
df	4	Df	3
Asymp. Sig.	0.000	Asymp. Sig.	0.000

The results presented in Table 7.6 are based on the opinions of all 400 farmers who participated in the survey. Each of these respondents assigned rankings to the constraints that were identified and studied. According to the constraints on market access, the farmers rated lack of government support in complementary market services, unavailability of a market in farming area, high cost of transportation, poor road network and high cost of hiring spaces in the market as 1st, 2nd, 3rd, 4th and 5th respectively. The results show that lack of government support in complementary market services is the

top concern among the respondents with a mean rank of 2.15. This suggests that the government isn't providing adequate support for services that could enhance the market environment, such as infrastructure, marketing assistance, or information dissemination. This lack of support could hinder the overall growth of the agricultural sector.

According to Nayak and Bagchi, (2022), government investment in market infrastructure, such as transportation networks, storage facilities, and processing centres, is crucial for reducing post-harvest losses and maintaining the quality of produce. Without proper infrastructure, farmers may struggle to store, transport, and market their products effectively. Following lack of government support in complementary market services is unavailability of a market in farming area with a mean rank of 2.18. This constraint indicates that farmers in the area have difficulty accessing a suitable market for their agricultural products. Similar study by Kuivanen et al., (2016); Darfour and Rosentrater, (2016), also revealed that lack infrastructure is a major challenge. This could lead to reduced opportunities to sell their produce, impacting their income and livelihoods. . A study by Kamara, (2004) underscores this observation by indicating that aggregate physical productivity increases with improvement in market access. High cost of transportation with a mean rank of 2.67 is the 3rd most pressing constraints among the farmers in the study area. The transportation costs associated with moving agricultural goods from the farm to the market are relatively high. This can significantly reduce the profit margins for farmers and make their products less competitive in the market (Twumasi, Jiang & Acheampong, 2019). This observation is also consistent with the results of Ajiboye and Afolayan (2009) where Thirty percent of the respondents very much agreed to the statement transportation has an effect on the production level of the farmers as well as the price of the crops whilst 48% mentioned they agreed, 20% slightly agreed and the remaining 2% do not agree at all to the statement. Also, poor road network and high cost of hiring spaces in the market with mean ranks of 3.58 and 4.42 respectively were the least most pressing constraints among the farmers. The inadequate road network can make transportation challenging and costly. It might lead to delays in bringing

produce to the market, causing spoilage and losses, and also increasing transportation expenses. A similar research by of Ajiboye and Afolayan (2009) shows that 42% of the respondents believed that an improvement in the condition of the road will help them have easier access to markets for their kolanut, 27% believed that it would help their crop to attract higher prices by increasing the demand, 7% believed that it will help them to have easier accessibility to farms, 3% was of the opinion that it will help to reduce damaged and spoilage of crops before getting to the markets while 21% of them believed that it will help to reduce majority of the problems they have been having in their farm work. High cost of hiring spaces in the market highlights that the expenses associated with renting market stalls or spaces are prohibitively high. This cost might further reduce the profit margins for farmers, especially those with limited resources (Darfour & Rosentrater, 2016). The outcomes of the analysis demonstrated a Kendall's Coefficient of Concordance of 38.5%, and this finding held substantial significance at the 1% level. This highlights a notable degree of consensus among the farmers involved in the study. In simpler terms, it indicates that a considerable proportion, approximately 39%, of the farmers within the study region were in concurrence with the hierarchy assigned to the constraints. This implies that there is a shared viewpoint among a significant portion of farmers regarding the order of importance of these constraints.

Additionally, the constraints to marketing linkage was also ranked by the farmers. The farmers ranked high cost of exportation (Shipping), unavailability of storage, high cost of storage and Inability to access regional market as 1st, 2nd, 3rd, and 4th respectively. However, the detail results indicates that High cost of exportation (Shipping) is the most significant constraint among the farmers in the study area with a mean rank of 1.27 in the Marketing Linkage category. It indicates that the expenses related to exporting agricultural products, particularly shipping costs, are a major burden. This could deter farmers from entering international markets. This finding is in line with that of Darfour and Rosentrater, (2016) which reveals the challenge above faced by Ghanaian farmers. A similar study by Radelet et al., (1998) also highlighted the point that for small countries

that exert little impact on world prices, the higher the shipping costs, the more that firms will have to pay for imported intermediate goods, and the less they will receive for their exports. Unavailability of storage was the second most significant constraint with a mean rank of 3.13. The absence of proper storage facilities can lead to post-harvest losses, reducing the overall efficiency of the agricultural supply chain. Farmers might struggle to store surplus produce for future periods of higher demand as revealed by (Quartey & Darkwah, 2015; Adeyeye, 2017). Research by Accorsi et al., (2017) also proved that proper and sufficient capacity for storage and availability of cold storage and warehouse facilities are considerably significant for reducing wastage and maintaining the agricultural product quality. Farmers might struggle to store surplus produce for future periods of higher demand. High cost of storage (mean rank: 2.31) and Inability to access regional market (mean rank: 3.30) were the least significant constraints among the farmers. Even if storage facilities are available, the cost of using them is relatively high. This can impact farmers' ability to store their produce without incurring substantial expenses. This result supports the findings of Darfour and Rosentrater, (2016) which stated that poor storage facilities and high storage cost for farmers is a major determinant of postharvest losses. Farmers are facing challenges when attempting to enter regional markets, possibly due to regulatory barriers, lack of market information, or other obstacles. This constraint restricts their ability to tap into potentially larger and more lucrative markets (Bezu & Barrett, 2012). However, the farmers indicated that these two constraints were the least of their problems. The findings displayed that Kendall's coefficient of concordance stands at 65.3%, and this outcome held significance at the 1% level. This points to a strong level of agreement among the farmers involved. To put it simply, a considerable portion, around 65%, of the farmers in the study area were in alignment with the order of constraints. Interestingly, the majority of farmers in the study area shared common ground when it came to the rankings of these constraints. Furthermore, the null hypothesis, which suggests no agreement among the farmers, was disproven at the 1% significance level. In other words, the data indicates that the farmers were indeed in agreement regarding the rankings of constraints, contrary to the notion that they were not.

7.6.2 Qualitative findings on constraints

The farmers recognised these constraints as the most critical ones preventing them from accessing markets based on the qualitative responses. These constraints include; limited information, poor infrastructure, low aggregation and fragmentation, limited access to credit and financial services, quality and standards compliance, lack of skills and training, insight into limited market linkages and seasonal and climate vulnerabilities (Quartey & Darkwah, 2015; Adeyeye, 2017; Twumasi, Jiang & Acheampong, 2019).

The challenge of limited information emerges as a recurrent theme. As articulated by Participant 3, a lack of adequate information on market trends, prices, and demand patterns often leads to miscalculated production efforts, subsequently resulting in economic losses. Similar study by Kuusaana et al., (2022) also highlighted same challenge. Similarly, infrastructure deficiencies, pinpointed by Participant 4, directly affect the transportation and preservation of produce. This factor alone can drastically limit the geographical reach of a farmer's market. Fragmentation and low aggregation further compound these challenges. With farms scattered and relatively small in size, individual selling efforts face the brunt of market dynamics, often tilting the scale against these farmers. Financial constraints, as highlighted by multiple participants, form another critical barrier. The lack of access to credit and financial services inhibits investment in quality-improving assets, perpetuating a cycle of subpar production (Molini & Paci, 2015).

Quality and standards compliance, a necessity in today's market, poses its set of challenges. With stringent quality requirements and a lack of resources to meet them, farmers often find their produce undervalued or even rejected. This scenario underscores the essential need for skill enhancement and training, an area where many farmers feel they lag behind (Ankuyi et al., 2023). The reliance on middlemen, due to limited direct market linkages, also eats into the farmers' earnings, reflecting the systemic inefficiencies plaguing the sector. Finally, the unpredictable nature of seasonal and climate changes

adds a layer of uncertainty to an already challenging landscape, affecting crop yields and consequently, market promises. Some quotations from the participants are as follows:

Limited Information (Participant 3): *“First off, there's this issue of Limited Information. We're often not clued in on things like market prices or what's in demand. So, we might end up growing a bunch of crops only to find out no one's buying them, and that's a real hit to the pocket.”*

Participant 4 discussed Poor Infrastructure: *“It's a struggle, I tell you. Bad roads and not enough storage spots mean our produce might rot away before it even gets to market. We're kind of stuck selling close by, missing out on customers who might want our stuff from farther away.”*

Participant 4 recognized Low Aggregation and Fragmentation: *“Well, see, our farms are not that big, and when we sell alone, we're at the mercy of the big buyers. If we could band together and sell as a group, we'd have more pull and could strike better deals.”* (Male administrator 40 years).

Limited Access to Credit and Financial Services: *“Oh, it's a tough one. Without credit, we can't invest in better tools or seeds. And that means we can't really boost our game or meet those quality standards everyone's talking about. It's like trying to run a race with one leg.”* (Male administrator aged 36).

Participant Five highlighted Quality and Standards Compliance: *“Meeting the quality rules are not easy. We lack the know-how and cash to meet them, and that means our produce can get tossed out or sold on the cheap. No one's going pay high prices for goods that do not meet the standards.”*

Participant 6 discussed Lack of Skills and Training: *“You see, there're better ways to farm out there, but without learning new tricks, we're stuck in the past. Buyers want top-notch stuff, and without the right skills, we're kind of left behind.”*

Participant 6 provided insights into Limited Market Linkages: *“We often rely on middlemen to sell our produce, and they take a slice of the pie. We cannot blame them because they have to also feed their families. If we had more direct lines to buyers, we could cut out the middleman and make more for ourselves.”* (Male administrator 30 years).

Seasonal and Climate Vulnerabilities were taken into account: *“Ah, the weather, it's a real wild card. Sometimes, our crops just don't make it due to unpredictable changes. When that happens, we can't keep our promises to buyers, and they start looking elsewhere. It's not their fault and it's not our fault either, we just have to keep our fingers crossed and hope for the best.”* (Female administrator 40 years).

Collectively, these constraints highlight a complex array of challenges, emphasizing the need for comprehensive interventions and solutions to uplift Ghana's small-scale farmers. These challenges have been highlighted in similar studies such as (Quartey and Darkwah, 2015; Adeyeye, 2017; Twumasi, Jiang and Acheampong, 2019; Knerr et al., 2018; Kuusaana et al., 2022; Ankuyi et al., 2023) which has direct or indirect implication on farmers' welfare.

7.6.3 Potential solutions to address challenges

The issue of market access for small-scale farmers in Ghana is not a standalone challenge but is interwoven with various factors that either facilitate or hinder their potential. Addressing these challenges requires an inclusive approach, taking into consideration the unique circumstances and needs of these farmers (Molini, and Paci,

2015). The farmers proposed the following potential remedies based on the qualitative responses to address the challenges they have while trying to access markets:

“First of all, for Limited Information, we need some sort of information-sharing system. A platform where we can know what's in demand, the best prices, and where buyers are looking. That way, we can focus on growing what consumers actually want.” “We have to push for better roads and proper storage facilities. If our produce can get to markets in good shape, buyers will be more interested, and we will not have to sell nearby all the time. How much of our produce can we sell to the locals, we need to send some outside our communities, this way we can attract better prices.”

“We could form co-operatives or farmer groups. When we team up, we've got more bargaining power. Plus, sharing resources and knowledge can help us all grow better food for the people.” “Government should work with local banks or organizations to set up micro-loans or credit systems. With a bit of financial help, we could invest in better equipment and really step up with our production.”

“Training programs! If we learn the ropes of meeting those standards, we can improve the quality of our produce. That way, we won't have to worry about being rejected or getting low prices.” “Well, workshops and training sessions could do wonders. Teaching us new methods and techniques could help us produce more and better crops. That's bound to catch the buyers' eyes.”

“Building direct relationships with buyers is key. If we can find a way to connect with them without middlemen, we'll get better prices and keep more of the profit for ourselves because we're the ones suffering on the field day in day out.”

“Diversification could help. Planting different crops that can withstand different conditions could be a game-changer. That way, if one crop fails due to weather, we've got other options.”

With the right interventions, tailored to the genuine needs of the farmers, a promising path forward emerges. The proposed solutions highlight the potential for growth and creativity inherent within Ghana's small-scale farming community.

7.6.4 Enhancing and promoting smallholder farmers market access

In addition to the proposed solutions to the identified challenges, farmers gave general and innovative ways of enhancing and promoting smallholder farmers' market access. From the qualitative responses, it is evident that in order to enhance and promote market access among smallholder farmers, there is the need to focus on a number of areas including establishing information and communication channels, investments in infrastructure, work together as a group, financial assistance, learn new things, make things tasty, know your buyers and plant different stuff and be ready for the weather. Similar studies (Quartey and Darkwah, 2015; Adeyeye, 2017; Twumasi, Jiang and Acheampong, 2019) proposed strategies to improve market access for smallholder farmers which include; creating digital platforms, utilizing mobile technology, forming farmer cooperatives, direct marketing, adding value to products, providing access to finance, offering training programs, obtaining certifications, facilitating market linkages, and advocating for supportive policies.

Establish information and communication channels: *“We need to know what's happening in the markets, like what's in demand and what prices are like. If we have a system that tells us all this through our phones or community meetings, we can plan better and grow stuff that people want to buy.”*

Invest in infrastructure: *“Good roads and storage places are a must. If we can get our crops to the markets quickly and keep them safe, we won't lose so much and can sell at the right time when prices are good.”*

Work together as a group: *“If us farmers come together in groups, we can sell more. Buyers like big quantities, and we can also learn from each other and maybe even get loans as a group to improve our farms.”*

Financial assistance: *“It would be great if we can get loans or credit just for farming. We can use that money to buy better seeds, tools, and fertilizers, and that means better crops to sell.”*

Learn new things: *“If we have training on how to farm better, handle our crops, and keep them fresh, we can give the buyers good stuff. Learning about what the market wants is also important.”*

Make Things Tasty: *“We could try making things like jams or dried fruits from our crops. That way, we can sell them even when the fresh stuff is not in season.”*

Know Our Buyers: *“If we can sell directly to people or places nearby, that's cool. Farmers' markets or local events can help us talk to the people who want our stuff.”*

Plant Different Stuff and Be Ready for Weather: *“We should grow different crops that can handle the weather here. And if we know how to deal with changing weather, our farms can still produce even when it's tough out there.”*

These suggested strategies aim to improve market access for smallholder farmers in Ghana, highlighting the importance of comprehensive interventions to support them. These potential solutions have been echoed by various researchers in related studies

(Amaya, 2009; Magesa et al., 2014; Ferris et al., 2014; Quartey and Darkwah, 2015; Adeyeye, 2017; Twumasi, Jiang and Acheampong, 2019; Knerr et al., 2018; Kemboi et al., 2020; Ndlovu et al 2021; Kuusaana et al., 2022; Ankuyi et al., 2023) underscoring their significance for the well-being of farmers.

CHAPTER 8: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

8.1 Summary

The main objective of the study is to examine the role of the PFJ program in linking small-scale rural farmers markets in its five years of existence. To achieve this, a four relevant research questions were considered in Chapter One. The results and discussion of these were provided in chapter 7. This current chapter presents the summary conclusion and recommendation of this study

Farmers in the study area are young adults of 38 years on average with a female dominance. This highlights a significant presence of female farmers in the study area, consistent with the global trend of women's involvement in agriculture, particularly in developing nations. Sub-Saharan Africa, for instance, witnesses' women contributing to a substantial share of agricultural labour. Integrating gender-sensitive approaches into agricultural programs has been shown to enhance outcomes for both genders. Incorporating such strategies in the PFJ program could promote equity and reduce gender disparities in accessing agricultural resources and benefits.

Young farmers are more receptive to new agricultural technologies and innovations due to their openness to change and familiarity with modern technology. On average, participants had around 13.34 years of farming experience, indicating valuable traditional knowledge and expertise in local agricultural practices. This experience aids in informed decision-making, risk management, and adaptation to uncertainties in agriculture. Marital status played a role in participation, with 60.75% of respondents married to small-scale farmers, suggesting that married individuals were more engaged in the PFJ program. Married farmers typically have better access to resources, including land and finance, potentially due to the facilitation that marriage provides in resource acquisition. Around

61.50% of participants pursued activities beyond farming, indicating income diversification. Within the sample, 41% participated in the Planting for Food and Jobs (PFJ) program, aiming to increase agricultural productivity through subsidized inputs. Participation in PFJ correlated with increased yields, improved productivity, and better market access for small-scale farmers. 44.75% of the farmers have no formal education and about 47.5% of them with basic education. Education enables small-scale farmers to access valuable information and knowledge, enhancing their agricultural practices and decision-making abilities.

Based on the qualitative analysis, the farmers highlighted the challenges and potential solutions for enhancing market access. Market Information Services were highlighted as essential, empowering farmers with real-time data to make informed decisions, align production with demand, and optimize supply for better market access. Transformation and logistics support was emphasized, ensuring efficient handling, packaging, and transportation of produce to maintain quality and reduce losses. Aggregation and farmers' organizations were recognized as strategies to enhance bargaining power, access larger markets, and collectively market products. The significance of market days and direct engagement with consumers through community events was acknowledged for building relationships and receiving immediate feedback. Availability of processing centres was seen as a means to add value to raw produce, tap into different market segments, and extend product shelf life. Also, for the improved activities for market access and constraints market access.

Aggregation centres and collective marketing were highlighted for achieving economies of scale, attracting larger buyers, and standardizing product quality and packaging. Farmer field days and trade fairs were considered effective platforms for showcasing produce, interacting with stakeholders, and expanding market segments. Training on market requirements and quality standards was seen as critical for accessing higher-value markets and adopting best practices in packaging and handling. Access to financial

services, such as credit and loans, was recognized as crucial for investing in operations and seizing market opportunities. For the constraints, limited information about market trends and prices hindered informed decision-making, potentially leading to overproduction or underproduction. Poor infrastructure, including bad roads and inadequate storage facilities, led to product deterioration and limited access to distant markets. Low aggregation and fragmentation of small farms resulted in less bargaining power and challenges in negotiating favourable prices. Limited access to credit and financial services hindered investment in improved tools, seeds, and technologies, affecting productivity. Quality and standards compliance posed challenges, particularly for smallholders lacking the knowledge and resources to meet market requirements. Lack of skills and training restricted farmers' ability to adopt modern techniques and meet quality standards. Limited market linkages through middlemen reduced farmers' profits and access to direct buyers. Seasonal and climate vulnerabilities made it difficult to meet promises to buyers, affecting reliability and market access.

However, the farmers presented solutions to challenges in accessing markets. Establishing information and communication channels to provide real-time market insights and trends to farmers for informed decision-making. Investing in Infrastructure improvement, including roads and storage facilities, to ensure produce quality and timely transportation. Encouraging collaboration through group formations to enhance bargaining power and resource sharing among farmers. Access to financial support, such as micro-loans or credit systems, to enable investments in productivity-enhancing resources. Offering training programs to improve farmers' skills and knowledge in meeting quality standards and adopting modern practices. Encouraging diversification of crops to mitigate seasonal and climate vulnerabilities. Establishing direct buyer relationships through farmers' markets and local events to eliminate middlemen and increase profits. Enhancing market access among smallholder farmers in the community requires a multi-faceted approach that addresses information gaps, infrastructure limitations, collaboration, financial support, training, and direct market linkages. By implementing

these proposed remedies, farmers can make more informed decisions, improve product quality, access larger markets, and ultimately enhance their profitability and livelihoods.

The multivariate probit estimates reveal that age, religion, credit received, FBO affiliation, duration of FBO membership, and engagement in other activities impact rural small-scale farmers' market access under the PFJ program. Age emerged as a significant factor, impacting market information services and processing centre availability. Older farmers were more likely to utilize market information services, possibly due to their experience and awareness of market dynamics. However, as age increased, access to processing centres decreased, highlighting potential challenges faced by older farmers in accessing such facilities. Religion demonstrated significance concerning the frequency of community market days. Farmers adhering to specific religions were associated with more frequent market days, indicating potential social and cultural influences on market access dynamics within the community. The amount of credit received significantly affected market information services and farmers' aggregation efforts. Farmers who received credit had better access to market information and were more inclined to participate in aggregation, suggesting that financial resources can impact farmers' engagement with market-related activities.

Affiliation with farmer-based organizations (FBOs) showed mixed significance. While it did not significantly impact some aspects like market information services and aggregation, it displayed marginal significance in relation to transportation support and processing centre availability. This suggested that FBO membership might moderately influence these areas, potentially due to the networking and resource-sharing opportunities that FBOs can provide. The duration of FBO membership was statistically significant for processing centre availability. Longer membership duration correlated with increased access to processing centres, implying that sustained involvement in FBOs could enhance farmers' access to essential facilities. Engaging in non-farming activities emerged as a significant factor positively influencing both market information services

and processing centre availability. Farmers involved in non-farming activities had better access to market information and processing centres, underscoring the benefits of diversification in enhancing overall market access.

Multivariate probit estimates revealing influential factors affecting rural small-scale farmers' marketing linkages within the PFJ program. The results revealed that age, religion, marital status, years of farming experience, amount of credit received, belonging to an FBO, duration of FBO membership and engagement in other activities impact rural small-scale farmers' marketing linkages under the PFJ program. Age, while not a significant determinant for several aspects, does exhibit a notable influence on farmer training related to market requirements. This suggests that age could contribute to shaping farmers' preparedness to meet market standards, albeit with a moderate impact. Marital status emerges as a crucial factor, significantly impacting market access. Married farmers appear to have a more favourable position in terms of accessing markets, potentially due to enhanced access to resources and support through spousal collaboration. The amount of credit received plays a pivotal role, significantly affecting aggregation centres, market access, and farmer training. This connection implies that credit availability can have substantial implications for farmers' participation in market-related activities. Belonging to a Farmer-Based Organization (FBO) significantly influences aggregation centres, market access, farmer field days and trade fairs, and access to financial services. This underscores the role of collective action through FBOs in influencing farmers' marketing linkages. Duration of FBO membership positively correlates with market access, suggesting that longer engagement with FBOs can contribute to better market engagement over time. However, other factors, such as religion, years of farming experience, and engagement in other activities, exhibit more nuanced relationships with farmers' marketing linkages, with varying degrees of significance.

The *Kendall coefficient of concordance* results presented delves into the multifaceted constraints faced by rural small-scale farmers within the context of market access and marketing linkages under the PFJ program. Regarding market access constraints, Lack of government support in complementary market services emerged as the most pressing concern, with farmers indicating inadequate backing from authorities to enhance critical services such as infrastructure, marketing assistance, and information dissemination. Unavailability of a market in farming areas highlighted the difficulty farmers encounter in finding suitable markets, affecting their income prospects. High cost of transportation further compounds these challenges, as the elevated expenses of transporting goods impact profit margins. Poor road networks and high costs of hiring spaces in the market were identified as relatively less pressing but still significant constraints. The remarkable *Kendall's coefficient of concordance* of 38.5% underlined the consensus among farmers on the hierarchy of these constraints, revealing a shared perspective among approximately 39% of respondents. This aligns with the notion that a substantial portion of farmers collectively recognizes the order of importance of these issues.

Similarly, in the realm of marketing linkages, high cost of exportation (shipping) emerged as the most significant constraint, emphasizing the formidable burden of export-related expenses, potentially hindering international market entry. Unavailability of storage facilities ranked second, accentuating the need for proper storage to mitigate post-harvest losses and enhance supply chain efficiency. High cost of storage and the Inability to access regional markets were noted as less significant challenges, affecting farmers' ability to store produce and tap into larger markets. The robust *Kendall's coefficient of concordance* of 65.3% demonstrated strong agreement among farmers regarding the ranking of marketing linkage constraints. Approximately 65% of the respondents were in alignment with the order of constraints, disproving the notion of disagreement and reaffirming a shared understanding of these issues.

Propensity scores matching results shed light on the crucial role of market access and marketing linkages in shaping the economic performance of farmers. The study compared the economic performance of farmers with access to market linkages (Treatment group) to those without access (Control group), and estimating the Average Treatment Effect on the Treated (ATT) using Radius Matching (RM) and Kernel Matching (KM) methods. The findings unequivocally indicate a positive and significant impact of market access and marketing linkages on farmers' economic performance. When utilizing the Radius Matching method, the economic performance of farmers with access to these linkages showed a meaningful improvement, with an increase of 0.973 in their economic performance. This suggests that their economic outcomes would have been significantly enhanced if they had access to market and marketing linkages. The Kernel Matching approach revealed an even more substantial positive effect, demonstrating an increase of 1.227 in economic performance for farmers with access to these linkages. Consistent across both matching algorithms is the evident link between improved economic performance and access to market and marketing linkages. The outcomes underscore the importance of facilitating effective market access and establishing robust marketing linkages to empower farmers economically. This has the potential to uplift their livelihoods, strengthen agricultural productivity, and contribute to overall rural development.

8.2 Conclusions based on the empirical findings

This section presents the conclusions from the study based on the key Objectives. The details of these conclusions are presented in the ensuring sub-sections.

- **Conclusions on Objective 1: Support services and market improvements due to the PFJ programme**

This objective employed content analyses to examine the major support services and market improvements of the market access and marketing linkage objective of the PFJ programme. The study concluded that the major support services and market improvements available for promoting market access by smallholder farmers under the PFJ programme are market Information services, transformation and logistics support services, aggregations and farmers organizations, market days in the community to the promotion of market access, availability of processing centers, aggregation centers, availability of farmer field days and trade fairs. Furthermore, the farmer envisioned that in these communities, availability of information services would information services their access to market linkage. Such services would deliver information pertinent to market information such as product and input prices, demand for the produce, availability of the produce, etc. such information will strengthen the already existing structures (support services) which has been instrumental in facilitating market access among smallholder farmers under the PFJ.

- **Conclusions of Objective 2: Drivers of market access and marketing linkages under the PFJ programme**

This objective investigated the drivers to rural small-scale farmers' market access and marketing linkages under the PFJ programme in Ghana. This was assessed using the multivariate probit analyses. The major market access factors are market information service, transportation and logistics support, aggregation and farmers' organization, market days in the community, availability of processing centers. The study revealed that the major factors influencing rural small-scale farmers' market access under the PFJ programme are the age of the farmer, involvement in in off farm activities, access to credit and FBO participation. With regards to the factor influencing market linkage factors include aggregation centres, farmer field and trade fairs, farmer training on market requirements, market access, and access to financial service. Key factors influencing marketing linkage include, age, religion, received any credit for farming, amount of credit received, source of credit, years of participating in FBO.

- **Conclusions of Objective 3: Impact of market access and marketing linkages on the economic performance under the PFJ programme**

Objective 3 assessed the impact of market access and marketing linkages on the economic performance [profit] of rural small-scale farmers under the PFJ programme in Ghana. This was assessed using propensity score matching technique which involved matching the performance of farmers having access to marketing linkages (Treatment) and the farmers having no access to market and marketing linkage (control group) based on the propensity score. The ATT which measures the effect of market access and marketing linkage on the economic performance was estimated using the Radius Matching-caliper and Kernel Matching. The findings reveal that market access and marketing linkages have a significant impact on the farmers economic performance. The findings suggest that participating in the PFJ increases the profitability of farmers by 28.2% which implies that farmers are better off with increased profits when they participate in the PFJ program.

- **Conclusions of Objective 4: Small-scale rural farmers constraints to market access and marketing linkages**

This examines the key constraints to market access and marketing linkages to small-scale rural farmers under the PFJ programme in Ghana. The Kendall Coefficient of Concordance was employed to assess the challenges and also measure the extent of agreement among the evaluators regarding the prioritization of the constraints.

The results show that lack of government support in complementary market services is a major constraint to markets access. This suggests that the support services provided by Government for market access is not adequate from the perspective of farmers and that government could provide more support services in terms improving the market environment, such as infrastructure, marketing assistance, or information dissemination. Other constraints regarding to markets access, include, unavailability of a market in

farming area, high cost of transportation, Poor Road network and High cost of hiring spaces in the market as the 2nd, 3rd, 4th and 5th constraints, respectively.

With regards to the constraints to marketing linkage, farmers ranked high cost of exportation (Shipping), unavailability of storage, high cost of storage and Inability to assess regional market were ranked as the 1st, 2nd, 3rd, and 4th most important constraints, respectively. However, high cost of exportation (Shipping) is the most important constraint among the farmers. Other qualitative findings reveal the limited Information, poor infrastructure, low aggregation and fragmentation, limited access to credit and financial services, and poor quality and compliance to standards.

- **Conclusions of Objective 5 (recommend potential solutions to address challenges) and Objective 6 (recommend ways to enhance and promote smallholder farmers market access)**

These conclusions are provided in the form of recommendations in the following sections.

8.3 Recommendations

Based on the summary and conclusion of the study, the following recommendations are made to enhance market access and marketing linkages for small-scale farmers and improve their economic performance:

- Recognizing the top constraints identified by farmers, there is a clear need for increased government support in complementary market services. Governments should invest in improving infrastructure, such as transportation networks, storage facilities, and processing centres. This would reduce post-harvest losses, ensure better product quality, and create an enabling environment for farmers to access markets effectively.

- To address the issue of unavailability of markets in farming areas. Efforts should be made to establish accessible markets within farming regions, reducing the need for farmers to travel long distances to sell their produce. This would not only save time and resources but also increase opportunities for farmers to reach consumers.
- High transportation costs are a significant challenge for farmers. Measures should be taken to mitigate transportation expenses, such as improving road networks, introducing transport subsidies, or encouraging collective transport solutions. Lower transportation costs would positively impact farmers' profit margins and market competitiveness.
- Given the positive influence of credit on various aspects, financial institutions should develop tailored credit options for farmers. These loans could support investments in improved seeds, equipment, and technologies, enhancing productivity and product quality, leading to better market access and increased economic performance.
- Strengthening and empowering FBOs can enhance market access and marketing linkages. FBOs can play a pivotal role in disseminating market information, organizing collective marketing efforts, and providing a platform for farmers to negotiate better deals with buyers. Government and development agencies should support FBOs through capacity-building and resource allocation.
- Improving access to market information services is essential for farmers to make informed decisions. Establishing information-sharing platforms through mobile technology, community meetings, or radio broadcasts can help farmers align their production with market demands and trends, enhancing their economic performance.
- Address the issue of inadequate storage facilities by investing in proper storage infrastructure. This would reduce post-harvest losses, allowing farmers to store surplus produce during times of low demand and sell at better prices when demand is high, ultimately improving their economic performance.

- Given the significant constraint of high exportation costs, governments and trade organizations should work to reduce export-related expenses, such as shipping costs. This would enable farmers to tap into international markets, diversifying their customer base and potentially boosting their economic performance.
- Providing training programs for farmers on market requirements, product quality standards, and modern farming practices is crucial. This would enhance their ability to produce goods that meet market demands, leading to increased sales and better economic outcomes.
- Efforts should be made to facilitate farmers' access to regional markets. This might involve addressing regulatory barriers, providing market information about regional demand, and improving transportation infrastructure across borders.
- Encourage collaboration among farmers by promoting the formation of cooperatives, associations, and collective marketing initiatives. These platforms foster knowledge exchange, resource sharing, and increased bargaining power, ultimately improving market access and economic performance.

Regular monitoring and evaluation of the effectiveness of interventions aimed at enhancing market access and marketing linkages are crucial. This will help ensure that the implemented strategies are producing the desired positive outcomes and allow for adjustments if necessary.

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APPENDIX

RESEARCH QUESTIONNAIRE



Dear Sir/Madam,

You have been selected to respond to questions contained in this questionnaire. Your responses would be seen as your perception of the ongoing investigation into the extent to which the Planting for Food and Jobs (PFJ) programme has ensured small-scale rural farmers' access to markets and marketing linkages.

The successes of the PFJ programme seek to enhance the productivity and wellbeing of small-scale farmers who are critical to Ghana's economic development as they produce over 80 percent of the total crop output in the country and hence are central to achieving self-sufficiency in food crops production. This goal will be realised in the wake of strong market access and increased market linkages. This study investigates and attempts to understand how market linkages interplay in translating productivity gains into increased incomes and welfare of small scale farmers in Ghana.

This study intends to develop a model that would support and enhance the market linkage and market access by small scale farmers under the PFJ programme in Ghana. responses would be collected by completing this questionnaire as indicated in each section.

Please note that this study is in fulfilment of the requirement for a Doctor of Philosophy in Business Management at the Central University of Technology and responses received would be used for the stated purpose of academic research only and treated in strict professional confidence.

Name: Gameli Prosper Agbanu
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FARMER QUESTIONNAIRE

A. QUESTIONNAIRE IDENTIFICATION

#	Questionnaire ID:	Response
A.2.1	Date:	
A.2.2	Starting time:	
A.2.3	Ending time:	
A.2.4	Country:	
A.2.5	Province / Region / State:	
A.2.6	District:	
A.2.7	Village/Community:	
A.2.8	Name of Enumerator	
A.2.9	Name of Respondent	
A.2.10	Are you the head of the Household? 1=Yes 0=No	
A.2.11	If No for question A.2.10 , what is your relationship to the household head? 1 = Wife; 2 = Husband; 3 = Adult child living at home; 4 = other (mentioned) NB: (Interview should only be carried out with one of the three adult members of the household i.e husband or wife or adult member living in the household)	
A.2.12	GPS coordinates of residence (waypoint) (please use your phone to capture the coordinates for hard copy)	Latitude: [_____] Longitude: [_____] Elevation: [_____]

B. SOCIO-ECONOMIC CHARACTERISTICS OF FARMERS

No.	VARIABLE	RESPONSE
B.1	Gender	1. Male [] 2. Female []
B.2	Age (years)	.....
B.3	Religion	1. Muslim [] 2. Christian [] 3. Traditional [] 4. Others []
B.4	Marital Status	1. Single [] 2. Married [] 3. Divorced/Separated/Widow []
B.5	Educational Status	1. No Formal Education [] 2. Elementary Education [] 3. Junior High School [] 4. Senior High School [] 5. Tertiary Education []
B.6	Years of schooling	.....
B.7	Years of farming	.....
B.8	Annual Income/sales (GHS)	.....
B.9	Did you receive any credit for your farming activities this year?	1. Yes [] 2. No []
B.10	If yes, how much credit did you receive? (GHS)	.....

B.11	If yes what was the source of credit?	a. Micro credit institutions [] b. Local money lenders [] c. Families and friends [] d. Commercial/rural banks [] e. farmer based organisations f. Religious Groups [] g. Other, please specify []
B.12	Do you belong to any farmer based organisations?	1. Yes [] 2. No []
B.13	If yes how long have you been a member of the FBO(years)?	.....
B.14	Do you engage in any other income generating activity apart from farming?	1. Yes [] 2. No []
B.15	If yes, on average, how much are you able to obtain from this activity per month (GHS)?	.....
B.16	Do you participate in the PFJ programme?	1. Yes [] 2. No []
B.17	If yes, how many years have you been participating in the programme	.....
B.18	Do you cultivate more than one of the specified crops under the PFJ programme?	1. Yes [] 2. No []
B.19	Which of the following crop(s) under the PFJ programme do you cultivate?	1.Maize [] 2.Rice [] 3. Soybeans [] 4. Sorghum [] 5. Vegetables []

If yes to question B.19 above, kindly specify the harvest characteristics of the crop(s) selected since 2019

CROP(S)	QTY HARVESTED/UNIT			QTY SOLD			UNIT PRICE		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Maize									
Rice									
Soybean									

If yes to question B.19 above, kindly specify the inputs received through the Programme since 2019

INPUT(S)	QTY RECEIVED			UNIT PRICE		
	2019	2020	2021	2019	2020	2021
Fertilizer						
Seed						
Pesticide						

C. FARM-LEVEL FACTORS

- C.1. How many acres of maize did you cultivate in 2019 _____ 2020 _____ 2021 _____
- C.1. How many acres of soybean did you cultivate in 2019 _____ 2020 _____ 2021 _____
- C.1. How many acres of soybean did you cultivate in 2019 _____ 2020 _____ 2021 _____
- C.2. How many maize fields/plots you cultivate in 2019 _____ 2020 _____ 2021 _____
- C.2. How many soybean fields/plots you cultivate in 2019 _____ 2020 _____ 2021 _____
- C.2. How many rice fields/plots you cultivate last in 2019 _____ 2020 _____ 2021 _____
- C.3. How many household members are involved in maize/soybean/rice farming activities? M _____ F _____
- C.4. What type of maize variety did you cultivate? 1. OPV 2. Hybrid
- C.5. If you selected OPV as an answer to C.4, what is the major OPV you cultivate? 1= Abontem, 2=Omankwa, 3=Ahoodzen, 4=Honampa 5=Abeleehi, 6=Obatanpa, 7=Other (specify) _____
- C.6. If you selected Hybrid as an answer to C.4, what is the major Hybrid you cultivate? 1= Panar, 2=Pan 53, 3=Ahoofe, 4=Dzifoo, 5 =Opebro, 6=Tim tim 7=Other (specify) _____
- C.7. What variety of soybean do you cultivate last season/year? 1. Salintuya-1&2 2. Jenguma 3. Quarshie 4. Afayak 5. Suong-Pungun 6. Other (specify) _____
- C.8. What variety of rice do you cultivate? 1. AGRA 2. Jasmine 3. Amankwatia 4. Togo marshal 5. CRI Enapa 6. Other (specify) _____
- C.9. What variety of soybean do you cultivate? 1. Upland 2. Lowland 3. Irrigated lowland 4. Other (specify) _____
- C.10. What is the main source of improved maize/soybean/rice varieties you cultivated in 2019? 1=Research Institution/Universities 2=NGOs 3. Seed growers 4. Other farmers 5=Through PFJ programme, 6=Other, (specify) _____

D. LAND TENURE AND INTENSITY

Type of tenure	Acreages under maize	Acreages under soybean	Acreages under rice
D.7.1a: Owned	D.7.1b: _____	D.7.1c: _____	D.7.1d: _____
D.7.2a: Rented from others	D.7.2b: _____	D.7.2c: _____	D.7.2d: _____
D.7.3a: Sharecropping	D.7.3b: _____	D.7.3c: _____	D.7.3d: _____

D.7.4 If land was rented, what was the rent per annum (GHC) _____

E. SUPPORT SERVICES AND MARKET IMPROVEMENTS

Rate the following support services on a scale of 1-4 where 1= major support service and 4= minor support service in that order

SUPPORT SERVICES: RANK FROM 1-4		
No.	SERVICE	RANKING
E.1	50% subsidy on seeds	
E.2	50% subsidy on fertilizer	

E.3	Complementary extension services	
E.4	Complementary service in the marketing of outputs	

MARKET IMPROVEMENTS		
No.	VARIABLE	RESPONSE
E.5	What is the distance from your farm to the nearest market? (km)	.....
E.6	What is the distance from your farm to your house? (km)	.....
E.7	Do you have access to transportation?	1. Yes [] 2. No []
E.8	Do you pay for transporting your farm produce to market?	1. Yes [] 2. No []
E.8	If yes, how much do you pay on average per 100 kg bag of maize?	.....
E.9	If yes, how much do you pay on average per 100 kg bag of soybean	.....
E.10	If yes, how much do you pay on average per 100 kg bag of rice	.....
E.11	Do you have access to storage facilities?	1. Yes [] 2. No []
E.12	If yes, do you pay for storing your produce at the facility?	
E.13	If yes, how much do you pay for storing 100 kg bag of maize per month?	.....
E.14	If yes, how much do you pay for storing 100 kg bag of soybean per month?	.....
E.15	If yes, how much do you pay for storing 100 kg bag of rice per month?	.....
E.16	Do you export some of farm produce?	1. Yes [] 2. No []
E.17	If yes, what proportion of the farm maize did you export in 2021?	%
E.18	If yes, what proportion of the farm soybean did you export in 2021?	%
E.19	If yes, what proportion of the farm rice did you export in 2021?	%
E.20	Do you receive any complementary service in the marketing of your output?	1. Yes [] 2. No []
E.21	If yes, kindly specify the form of complementary service	.....

E.22	Do you receive training from extension agents?	1. Yes [] 2. No []
	If yes, how many time have you received or participated in such trainings?	2019 _____ 2020 _____ 2021 _____

F. FARMERS' MARKET ACCESS AND MARKETING LINKAGES

No.	VARIABLE	RESPONSE
F.1	Do you have access to a market?	1. Yes [] 2. No []
F.2	If yes, kindly specify the type of market	1. Local market [] 2. District market [] 3. Regional Market [] 4. International Market []
F.3	Distance to the market (Km)	.....
F.4	Are you a member of any trader groups in your community?	1. Yes [] 2. No []
F.5	If yes, for how long have you been a member of the organization	.....
F.6	What is your major means of transport to these markets. 1=Truck/Haulage 2=tricycle 3=Ocean/sea/river 4=Air/flight	Local market _____ District market _____ Regional Market _____ International Market _____

G. ECONOMIC PERFORMANCE OF RURAL SMALL-SCALE FARMERS in 2021

Cost Items	Maize		Soybean		Rice	
	Qty used	Unit price (GHS)	Qty used	Unit price (GHS)	Qty used	Unit price (GHS)
Seed						
Fertilizer						
Pesticides						
Weedicides						

Storage						
Transportation						
Others						

H. LABOUR USED FOR FARMING ACTIVITIES 2021

Cost Items	Family Labour			Hired labour			Contract labour (total cost per activity)
	No.	Days	Unit cost	No.	Days	Unit cost	
Land preparation							
Planting							
Fertilizer application 1							
Fertilizer application 2							
Weedicide application							
Harvesting							
Post-harvest activities							
Storage							

I. CONSTRAINTS OF MARKET ACCESS AND MARKETING LINKAGES TO FARMERS

Rate the following constraints on a scale of 1-6 where 1= most pressing and 6= least pressing, in that order.

MARKET ACCESS	Ranking
Unavailability of a market in farming area	
High cost of transportation	
Poor road network	
Lack of government support in complementary market services	
High cost of hiring spaces in the market	
Other Specify.....	
MARKETING LINKAGES	Ranking
Inability to access regional market	
High cost of exportation (Shipping)	
Unavailability of storage facilities	

High cost of storage	
Other Specify.....	

Thank you

Dear Sir/Madam,

You have been selected to respond to questions contained in this questionnaire. Your responses would be seen as your perception to the on-going investigation into the extent to which the PFJ programme has ensured small-scale rural farmers' access to markets and marketing linkages.

The successes of the planting for Food and Jobs programme seeks to enhance productivity and wellbeing of small scale farmers who are critical to Ghana's economic development as they produce over 80 percent of the total crop output in the country hence very central to achieving self-sufficiency in food crops production. This goal will be realised in the wake of a strong market access and increased market linkages. This study investigates and attempt to understand how market linkages interplay in translating productivity gains into increased incomes and welfare of small scale farmers in Ghana.

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FOCUS GROUP DISCUSSION GUIDE

1. What are the main support services available for promoting market access by smallholder farmers in this community/district? Please list them.
2. Are these services helpful in promoting market access in by smallholder farmers in. this community and why?
3. Are there any other market support services that farmers in this community could want to have in order to enhance their market access?

4. Mention this service and explain how such services could enhance market access among small scale farmers the community
5. What are the main market improvements activities available for promoting market access by smallholder farmers in this community/district? Please list them,
6. Are these market improvements activities helpful in promoting market access in by smallholder farmers in. this community and why?
7. Are there any other market market improvements activities that farmers in this community could want to have in order to enhance their market access?
8. Mention these market improvements activities and explain how such activities could enhance market access among small scale farmers in this community
9. What are the key constraints to market access by small scale farmers in this community and how to they impede market access by the farmers?
10. What are the potential solutions or proposed remedies that needs to be put in place to address these challenges and hence enhance market access? Explain how such solutions can enhance market access by small scale farmers
11. In your opinion, how do you think market access can be enhanced and promoted among smallholder farmers in this community particularly to the nearest markets? Explain your response.